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USAID/BURUNDI

FOREIGN ASSISTANCE ACT SECTIONS 118/119 TROPICAL FORESTS AND BIODIVERSITY ANALYSIS

JUNE 2022

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USAID/BURUNDI

FOREIGN ASSISTANCE ACT SECTIONS 118/119

TROPICAL FORESTS AND BIODIVERSITY ANALYSIS

MAY 2022

Prepared by: ICF and The Cadmus Group LLC

Analysis Team:

Paola Bernazzani, Jaime Capron, Arsene Manirambona, Leónidas Nzigiyimpa.

Contributors:

Maddie Dellert, Carmen Saab, Laura Simmons-Stern, Laura Hammett, Jamie Liu, and Jake Sousa.

ICF

9300 Lee Highway
Fairfax, VA 22031 USA
+1-703-934-3000
www.icf.com

The Cadmus Group LLC

100 Fifth Avenue, Suite 100
Waltham, MA 02451 USA
+1-617-673-7000
www.cadmusgroup.com

ACRONYMS

DOs	Development Objectives
DRG	Democracy, Human Rights, and Governance
EAC	East African Community
EG	Economic Growth
EIA	Environmental Impact Assessment
FAA	Foreign Assistance Act
FAO	Food and Agriculture Organization of the United Nations
FMNR	Farmer Managed Natural Regeneration
GEF	Global Environment Fund
GDP	Gross Domestic Product
GOB	Government of Burundi
IBA	Important Bird Area
IAP	Integrated Approach Program
ISABU	Institut des Sciences Agronomiques du Burundi / Institute of Agronomic Sciences of Burundi
INECN	Institut National pour l'Environnement et la conservation de la Nature / National Institute for Environment and Nature Conservation
IRs	Intermediate Results
IUCN	International Union for Conservation of Nature
NAPA	National Adaptation Plan of Action
NGO	Non-governmental organization
NRM	Natural Resource Management
OBPE	Office Burundais pour la Protection de l'Environnement / Burundian Office for the Protection of the Environment
PND	Plan National de Développement / National Development Plan
REDD+	Reducing emissions from deforestation and forest degradation
UN	United Nations
CBD	United Nations Convention on Biodiversity
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEP	United Nations Environment Programme
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development

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EXECUTIVE SUMMARY

INTRODUCTION

This Executive Summary presents key findings for the United States Agency for International Development (USAID) Burundi Foreign Assistance Act (FAA) Sections 118/119 Tropical Forests and Biodiversity Analysis (Analysis) and accomplishes the following:

- Highlights the status of tropical forests and biodiversity throughout Burundi.
- Identifies primary threats and underlying drivers of those threats to tropical forests and biodiversity.
- Provides recommendations to better integrate tropical forests and biodiversity conservation into the new USAID/Burundi Results Framework.

The Analysis informs development of the USAID/Burundi Results Framework, which will frame USAID foreign assistance programming in Burundi for the period 2022 – 2025. The Analysis considers tropical forests and biodiversity issues across the entire country.

STATUS OF TROPICAL FORESTS AND BIODIVERSITY

The terrain, climate, and ecology of Burundi are characterized by remarkable diversity given the small size of the country. Endemism and high levels of historic biodiversity are associated with the East African Rift System which roughly bisects the country and is largely encompassed by Kibira National Park. In addition, Lake Tanganyika cichlids are the most morphologically and genetically diverse in the region. However, with huge demographic pressures, a legacy of conflict, persistent and extreme poverty, and agricultural issues exacerbated by land-tenure rights, the status of tropical forests and biodiversity in Burundi is extremely vulnerable. Tree planting programs have helped staunch the massive deforestation of Burundi, but efforts are insufficient. The need for a growing population to use charcoal and firewood for cooking has decimated most of the primary forest in Burundi. While assessments of forest loss vary, in part based on canopy density, most estimates agree that 11% or less of Burundi remains forested and about half of that is primary forest. Similarly, most of Burundi's wildlife heritage has become extirpated, including African wild dog, cheetah, gorilla, and wild elephants. Chimpanzees, waterbuck, water buffalo and even a recently discovered frog species are relegated to the few protected areas that remain.

THREATS AND DRIVERS OF BIODIVERSITY LOSS

Results of a literature review, interviews, and site visits reveal significant threats to biodiversity and forests in Burundi. USAID's Biodiversity Policy defines a threat as "a process that explicitly causes degradation or loss of biodiversity." The Analysis Team sequenced the threats listed below based upon the intensity of the threat, its geographic breadth, and ultimately its imminent impact to biodiversity, as informed by concerns communicated by stakeholders and desk-based research:

- Encroachment in Protected Areas and Human-Wildlife Conflict
- Poorly Regulated Infrastructure Development
- Timber Harvest for Charcoal, Firewood, and Construction
- Bush Fires
- Illegal, Unsustainable, and Poorly Regulated Fishing
- Climate Change

- Poaching, Subsistence Hunting, and Illegal Wildlife Trade
- Poor Agricultural Practices
- Aquatic Pollution and Poor Solid Waste Management
- Invasive Species
- Mining

A driver is the ultimate factor -- usually social, economic, political, institutional, or cultural -- that enables or otherwise adds to the occurrence or persistence of one or more threats. There are many drivers of the threats identified above, but the most significant and influential drivers in the country are as follows:

- Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods
- Lack of Energy Alternatives
- Land Tenure Challenges and Legacy of Conflict
- Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity
- Lack of Environmental Data and Monitoring
- Institutional Weaknesses
- Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors
- Climate Change

RECOMMENDATIONS

TABLE ES I. HIGH-PRIORITY RECOMMENDATIONS

DEMOCRACY, HUMAN RIGHTS, AND GOVERNANCE

Strengthen civil society – specifically organizations focused on integrated programs including environmental conservation.

ECONOMIC GROWTH

Promote sustainable agroecology compatible with biodiversity such as organic farming practices, soil/water conservation, agroforestry, and fruit tree production. Where possible link to broader nutrition objectives.

Promote a policy of zero deforestation from agriculture and improve current agricultural practices to limit key threats.

Incorporate biodiversity conservation into the USDA School Feeding program (e.g., supporting charcoal alternatives, fuel efficient cookstoves, conservation messaging)

Improve efficiencies of existing agriculture or promote shifts to crops that are more efficient (i.e., offer improved yields and/or are nutrient and water efficient) and sustainable over the long term. Explore use of climate-resilient seed varieties with an awareness of the tradeoffs associated with nonnative or engineered seeds.

Work with farmers to improve access to markets, create efficiencies, and to support a value chain that makes sustainable products competitive and profitable. This may include the development of certification programs such as organic product, shade-grown coffee, or fair-trade programs – all of which are dependent on access to regional and international markets.

TABLE ES I. HIGH-PRIORITY RECOMMENDATIONS

HEALTH

Ensure that - in all areas receiving insecticide-treated bed nets proximate to waterways - distribution is complemented by education on proper bed net use and the hazard of illegal and improper use for fishing. Support enforcement of proper bed net use and monitor other regional efforts at managing this issue to implement any locally appropriate solutions.

Promote health education in poor communities including integrated family planning, to address both land tenure concerns and demographic concerns driving threats to biodiversity.

CROSS-CUTTING

Explore participation in the USAID/Central Africa Regional Program for the Environment and USAID/East Africa Environmental Programs (e.g., Conserving Natural Capital and Enhancing Collaborative Management of Transboundary Resources in East Africa project) that support transboundary collaboration.

Engage with the International Visitor Leadership Program and promote opportunities to develop leadership and technical expertise within Burundi, specifically with respect to the environment and sustainable agriculture.

Promote the role of marginalized communities by promoting work in biodiversity monitoring and oversight for women, communities, and youth.

I INTRODUCTION

I.1 PURPOSE

The purpose of this activity is to conduct an analysis of tropical forests and biodiversity in compliance with Sections 118/119 of the Foreign Assistance Act (FAA) of 1961, to best serve the United States Agency for International Development (USAID) Mission in Burundi as they develop the 2022 – 2025 USAID/Burundi Results Framework. Based on this analysis USAID/Burundi will define to what extent the Strategic Framework and future programming will contribute to biodiversity conservation needs in the country. The analysis will assist in strengthening the Mission’s role in biodiversity conservation by integrating the conservation of tropical forests and biodiversity into the Results Framework.

USAID’s approach to development requires that the Agency examine cross-sector linkages and opportunities to ensure a robust development hypothesis. Biodiversity conservation is a critical approach for achieving sustainable development and should be considered in Mission strategic approaches to improve development outcomes. The analysis, therefore, is an opportunity for the Mission to better understand the strategic linkages between the conservation of a country’s tropical forests and biodiversity and a country’s development, so that it can structure a sound Results Framework to support future programming.

As with the rest of the world, climate change is also a concern in Burundi. Therefore, the analysis will evaluate the threat to the country’s tropical forests and biodiversity from climate change. In addition to evaluating the climate change threat to tropical forests and biodiversity, the analysis team will consider climate change as a cross-cutting risk factor and will analyze and incorporate climate change, as appropriate, throughout the report. Climate change vulnerabilities are also considered in the report’s recommendations. The analysis team will identify innovative, integrated strategic approaches that link tropical forests and biodiversity conservation to all USAID technical sectors and to climate change.

I.2 BRIEF DESCRIPTION OF THE USAID PROGRAM

The current USAID/Burundi Results Framework is under revision and expected to be finalized in mid-2022, with the goal of laying the foundation to sustainable development and supporting the capitalization of peace in Burundi. The achievement of this goal is to be supported by three Development Objectives (DOs) and the following Intermediate Results (IRs).

TABLE I. USAID/BURUNDI 2022 DRAFT USAID RESULTS FRAMEWORK

DO1: HUMAN CAPITAL DEVELOPED	DO2: PEACE CAPITALIZED	DO3: SUSTAINABLE DEVELOPMENT ENHANCED
IR 1.1 Quality health services and systems strengthened	IR 2.1 Good governance strengthened	IR 3.1 Agriculture productivity growth enhanced
IR 1.2 Humanitarian assistance to vulnerable groups enhanced	IR 2.2 Civil society and private sector participation promoted	IR 3.2 Environment and climate change adaptation supported
IR 1.3 Education systems supported		

Currently, USAID/Burundi funds programs through the following technical offices¹:

- **Health:** The health portfolio is the Mission’s largest programming area, receiving \$42.9 million in FY21. Most of this funding (\$25.4 million) goes towards HIV/AIDS-focused initiatives via the President’s Emergency Plan for AIDS Relief initiative. The Mission’s health programming also includes funding for malaria control via the President’s Malaria Initiative, Family Planning, and Maternal and Child Health (USAID 2020b).
- **Democracy, Human Rights, and Governance (DRG):** The Mission’s DRG programming was approximately \$5 million in FY21. The Mission’s current portfolio of projects focuses on human rights, land tenure certification, support to trafficked persons, conflict resolution, and prevention, social cohesion, and peacebuilding (USAID 2020b).
- **Bureau for Humanitarian Assistance (BHA):** USAID/Burundi has received \$18 – \$20 million in funding for Emergency Response, Development Food Assistance/Food Security Assistance, and Disaster Prevention and Preparedness over the past several years. Programs receiving these funds focused on COVID-19 response and coordination, disaster assistance planning, and support to food security programs to alleviate acute malnutrition (USAID 2020b).
- **Economic Growth (EG):** The Mission received \$500 thousand in EG funds in 2021 and had one active project focused on improved value chain assistance and market linkages for coffee (USAID 2020b).

In FY22, USAID/Burundi hopes to see funds for DRG and EG increase and will seek funds for educational programming in line with the currently proposed USAID/Burundi Draft Results Framework.

1.3 METHODOLOGY

The purpose of the 118/119 Analysis is to inform development of the current USAID/Burundi Results Framework, which will frame USAID foreign assistance programming in Burundi for the period 2020 – 2025. This Analysis will:

- Summarize the status of tropical forests and biodiversity throughout Burundi.
- Identify primary threats and underlying drivers of those threats to biodiversity.
- Identify “Actions Necessary” to conserve and sustainably manage forest and biodiversity and the “Extent to Which” the Mission meets the actions necessary.
- Develop recommendations/opportunities to better integrate tropical forests and biodiversity conservation into the new country strategy.

As required by FAA 118/119 guidelines, our Analysis considers tropical forests and biodiversity issues across the entire country of Burundi.

This Analysis consists of four tasks:

- Task 1: Desk-Based Data Collection and Analysis
- Task 2: Work Plan and Logistical Preparations

¹ The USAID/Burundi BHA, DRG, and EG technical teams recently combined into one multi-sector team for the purposes of integrated planning. This report provides recommendations by technical office, thus breaking out current Mission programs by discreet technical office.

- Task 3: Mission and In-Country Consultations and Site-Based Visits
- Task 4: Preparation of FAA I 18/I 19 Analysis

The team collected information and conducted the analysis using the methods summarized in the text box. The full Statement of Work is provided in Annex A.

METHODS USED FOR THIS ANALYSIS

- Desk-based review of relevant scientific literature, published reports, and media accounts
- Stakeholder consultation with regional informants from non-governmental organizations (NGOs), U.S. Government, Burundian government, and the private sector
- Targeted in-country site visits and interviews
- Geographic Information System analysis
- Insight and best professional judgment from the analysis team

2 COUNTRY CONTEXT

2.1 LOCATION AND COUNTRY DEVELOPMENT CONTEXT

Making up part of Central Africa’s Western Rift Valley, Burundi is one of the smallest countries on the African continent, with a total land mass of 25,680 km². It is below Rwanda, with Tanzania to the east and south, and the Democratic Republic of Congo to the west. In 2021, the United Nations (UN) estimated the Burundian population to be about 11.9 million people (World Bank 2022). Averaging a growth rate of 3% annually, Burundi is one of the most densely populated countries in the Great Lakes region (World Bank 2022).

Beginning in 1890, Burundi was colonized, with Rwanda and Tanzania, as part of the German Protectorate of East Africa (Kahan 2022). In 1924, the Belgian colonial administration of the Ruanda-Urundi territory (Rwanda and Burundi) began following the end of World War I (Kahan 2022). Belgium’s colonial administrative structure had significant impacts on the future of ethnic conflict in the territory. The colony was governed under indirect rule, and the Tutsi were given administrative authority. Prior to colonization, Hutu and Tutsi ethnic identities were fluid, the two groups intermarried, and identification was based on livelihood and wealth (Kahan 2022). It was not until the Belgian colonial administration that ethnic identities, tied to wealth and political power, became a source of conflict (Kahan 2022).

Leading up to and following independence in 1962, political turmoil, coupled with ethnic tensions, led to periods of intense violence and displacement, most notably in 1972, the late 1980s, and 1993 – 1995 (CIA 2022). In 1972, a failed Hutu revolt and subsequent military crackdown led to the deaths of an estimated 200,000 to 300,000 Burundians, and approximately 300,000 refugees fled to neighboring countries (Lemarchand 2008). Civil and political unrest continued throughout the late 1960s through the 1980s (BBC 2018), culminating in civil war from 1993 – 2000 (Nantulya and 2015 n.d.). The 2000 Arusha Accords brought the civil war to an end between most armed groups, although some rebel groups continued fighting through 2003 (USAID 2022). Political unrest persisted in Burundi as recently as 2015,

preceding the elections where President Pierre Nkurunziza sought an unconstitutional third term (Steers 2015). Despite the country's history of political and ethnic conflict, Burundi appears to be stabilizing. The 2020 presidential election marked the beginning of an administration that is prioritizing renewed international engagement and internal reform (USAID 2022).

In addition to a history of conflict, Burundi faces several simultaneous development challenges including a rapidly growing population, economic stagnation, climate change, and high poverty rates. In 2020, 65% of Burundi's population was between the ages of zero and twenty-four (Interpeace 2022). Currently, youth aged zero to fourteen make up 44% of the population, while youth aged fifteen to twenty-four make up 29% (CIA 2022).

About 90% of the population relies on subsistence agriculture for their livelihoods, and nine in every ten people live in rural areas (UNICEF 2021). While a poor harvest has major implications for the country's economy at large, high rates of subsistence agriculture and increasing climate shocks impacting harvest also have the effect of increasing food insecurity ((CIA 2022). In 2020, 35% of the population suffered from food insufficiency, and Burundi was ranked highest on the Global Hunger Index for child stunting (WFP 2021).

Food insecurity is further exacerbated by projected impacts of climate change. While overall climate projections indicate there is an expected increase in annual precipitation in Burundi, precipitation *variability* is expected to increase and temperatures on average are expected to rise by 1.9°C by 2050. Longer dry seasons and increased intensity and frequency of droughts are also expected – all of which will have a significant impact on agricultural production (Ministry of Foreign Affairs of the Netherlands 2018). Burundi's smallholder farmers are highly vulnerable to these climate shocks and stressors with droughts and water deficits decreasing their yields and landslides and flooding contributing to the destruction of crops; all of these factors limit their access to markets..

As of 2020, over 70% of the Burundian population lives below the international poverty line of US \$1.90 per day (WFP 2021). The country's lack of economic diversification and historic dependence on foreign aid contributes to weak governmental infrastructure, corruption, high poverty rate, and poor educational levels (CIA 2022). Each of these development challenges prevents the implementation of planned economic reforms and have made it hard for Burundi to recover from post-independence conflicts (USAID 2022). These factors, among others, are drivers of biodiversity loss in the country (further discussed in Section 5).

2.2 BIOPHYSICAL SETTING

Burundi is a small country with a hilly landscape that drops into a plateau in the East. It covers 25,680km² of land and has an average altitude of 1,700m (varying between 772m and 2,670m). The country's topography is characterized by the Great Rift region that formed Lake Tanganyika in a trough-like fault in the West and series of plateaus in the East (Ministry for Land Management, Tourism, and the Environment 2007). The country was once rich in natural forests with abundant precipitation, a dense river network, numerous freshwater lakes, and fertile lands for agriculture. As forests have been cleared for agriculture, they now account for less than 11% of the country's territory (Global Forest Watch 2020; FAO 2020). Steep hillsides have increasingly been brought under cultivation without erosion control (World Bank 2018; FAO 2020).

Annual average temperatures vary between 23°C and 17°C, with an average annual rainfall of 150cm and two rainy seasons (February to May and September to November). As of 2018, it is estimated that 73.3% of its land is used for agriculture, 38.9% is arable land, 15.6% are permanent crops, 18.8% are permanent pasture, 6.6% is primary forest, and about 20.1% is used for other purposes (CIA 2022).



Figure 1: Map of Burundi

3 STATUS OF BURUNDI'S BIODIVERSITY, INCLUDING TROPICAL FORESTS

3.1 MAJOR ECOSYSTEM TYPES AND STATUS

3.1.1 TERRESTRIAL ECOSYSTEMS

The Albertine Rift

The Albertine Rift extends from 30 km north of Lake Albert to the Southern tip of Lake Tanganyika, including the valley, flanks of the escapement, and associated protected areas. The area covers around 313,000 km² and the habitats range from the glaciers and rock, at the top of the Ruwenzori mountains (5,100m), down through the alpine moorland (3,400-4,500m), Giant Senecio and Lobelia vegetation (3,100-3,600), giant heather (3,000-3,500), raised bogs (3,000-4,000), bamboo forest (2,500-3,000), montane forest (1,500-2,500), to lowland forest (600-1,500), savannas woodland (600-2,500), and savannas grassland (600-2,500) (Rwanda Development Board 2009). The Albertine Rift montane forests consist of a series of tropical moist broadleaf forests that form an ecoregion in east-central Africa occurring from Uganda to Tanzania and covering significant portions of Rwanda, the Democratic Republic of the Congo, and Burundi with the Albertine Rift Mountains dividing the Nile and Congo basin watersheds. Regionally, these forests are home to a high diversity of plant and animal life supporting the highest species richness of vertebrates on the African continent (Brooks et al. 2009). The temperature typically varies from 10°C to 22°C and is relatively stable throughout the year with lower temperature occurring at higher elevations. The region receives over 1200mm of annual rainfall typically concentrated during the wet season from October through May (Mahaney 2021).

Within Burundi, this ecosystem is concentrated in the Northwest and has been largely deforested (Olson et al. 2001). The ecoregion extends towards central Burundi where it transitions into more open savannas and woodlands in the eastern lowlands of the country and is typified by hills and valleys. In Burundi, the Albertine Rift montane forests have been shown to sequester much more carbon than lowland ecosystems, suggesting that its protection can contribute to reducing the harmful effects of climate change (Cuni-Sanchez et al. 2021). This ecosystem hosts numerous endemics, including 551 plant species, 36 species of amphibian, 16 species of reptiles, 41 species of birds, and 36 species of mammals (A. Plumtre et al. 2007). While data specific to Burundi's montane forests is sparse, it is likely that much of this diversity has been lost following extensive deforestation and habitat loss.

The Nyungwe–Kibira complex is one of the most ancient and extensive montane forest blocks in eastern Africa, dating back to before the last Ice Age. Located in the Albertine Rift eco-region and divided between Rwanda's Nyungwe National Park and Burundi's Kibira National Park, this is one of Africa's most biologically diverse ecosystems, and the combined parks represent the largest contiguous protected forest remaining in eastern Africa. In addition to its rich biodiversity, Kibira National Park is a water catchment area for the hydrological basins of the Congo River and the Nile River. It hosts many animal and plant species threatened with extinction across Burundi, as well as endemic or sub-regionally endemic species, such as the chimpanzee, Grauer's warbler, and muyovu, Africa's tallest indigenous tree.

Central Zambezan Wet Miombo Woodlands

The miombo woodlands are the most extensive tropical seasonal woodlands in Africa (Frost 1996). The ecosystem is common throughout the Central African Plateau occurring at approximately 1000m – 1600m of elevation from Angola and the Democratic Republic of Congo in the west to Tanzania in the East and as far south as Mozambique. The Miombo woodlands ecoregion occurs primarily in the southeastern lowland portions of the country. The region is named for the oak-like miombo (genus *Brachystegia*) trees that dominate the flat or gently undulating planes forming an open canopy. The soil in these regions is primarily composed of sand and clay to a depth of up to 3m and is highly weathered with low levels of nitrogen and phosphorus (P. Hakizimana et al. 2012). While overwhelmingly flat, the landscape is dotted with numerous isolated rocky hills. Burundi's miombo woodlands are classified as “wet” miombo woodlands, meaning that they receive greater than 1000mm of rainfall annually. The characteristic *Brachystegia* species are all present in Burundi, with a denser, higher canopy than in dryer climates, higher soil moisture, and a canopy typically above 15m (Frost 1996). Ground cover consists mostly of light-loving grasses and shrubs, despite moderate to high canopy cover. In Burundi, clear forests of miombo are located at medium altitudes between 850 and 1400 m. These forests are found in the regions of Mumirwa, Buragane, Kumoso and Buyogoma. Miombo woodlands were identified as one of the regional centers of endemism in Africa (Pye 1985). While soil conditions are not typically nutrient rich, termites, which occur in abundance, can produce local pockets of high productivity (Nduwarugira, Mpawenayo, and Roisin 2017). This habitat historically supported several megafauna species, including African water buffalo and, formerly, black rhinoceros.

Victoria Basin Forest-Savannah

The Victoria Basin forest-savanna ecoregion centers around Lake Victoria and extends through parts of Uganda, Kenya, Tanzania, Rwanda, and Burundi. Within Burundi, this ecosystem is limited to the northeastern portion of the country, including the Ruvubu National Park and the Murehe Forest Reserve. The ecoregion is characterized by rolling hills and plateaus with a high diversity of flora and fauna, including grass and shrub ground cover and sparse tree cover, but relatively low endemism compared to other African tropical ecoregions. The region typically experiences temperatures between 15°C and 27°C with mean annual rainfall between 1000mm and 1400mm occurring during two rainy seasons from March to May and August to November (Burgess et al. 2004).

Surveys of plant life in the Ruvubu National Park recorded 522 taxa with plants from the Fabaceae, Asteraceae, and Poaceae families representing the bulk of plant diversity (Masharabu et al. 2012). The region is also home to diverse avifauna of over 100 species (BirdLife International 2012). Populations of large mammals in the area were decimated by wars in the 1980s and 1990s for bushmeat and elephant ivory to sell for arms and are currently threatened by habitat loss from pastoral encroachment. Despite this, populations of hippopotamuses, buffalos, defassa waterbuck, marshbuck, and at least four primate species (olive baboon, diademed monkey, grivet, Pennant's red colobus) persist in the region (INECN 2014).

Zambezan Flooded Grassland

Burundi contains 3.2 km² of Zambezan flooded grasslands; seasonally or permanently flooded grasslands that occur in the Zambezan region, a broad belt of seasonally dry miombo and mopane savannas and woodlands that extend east and west across Africa, from northern Botswana, Namibia, and Angola in

the west to Tanzania and Mozambique in the east (Olson et al. 2001). Within Burundi, this is limited to a small area in the Southwest of the country surrounding the Malagarazi Nature Reserve, an 8 km² site consisting of a permanent freshwater river surrounded by marshes, woodland, and savannah forming the Burundian part of the Tanzanian Ramsar Site Malagarasi-Muyovozi Wetlands. It is a very important breeding ground for endemic fishes of the Congo basin and the Sudano-Zambezian ecoregion, hosting several bird species, including the endangered grey crowned-crane, hadada ibis, and the cape wagtail. It is also known as a habitat for hippopotamuses (RCS 2013c).

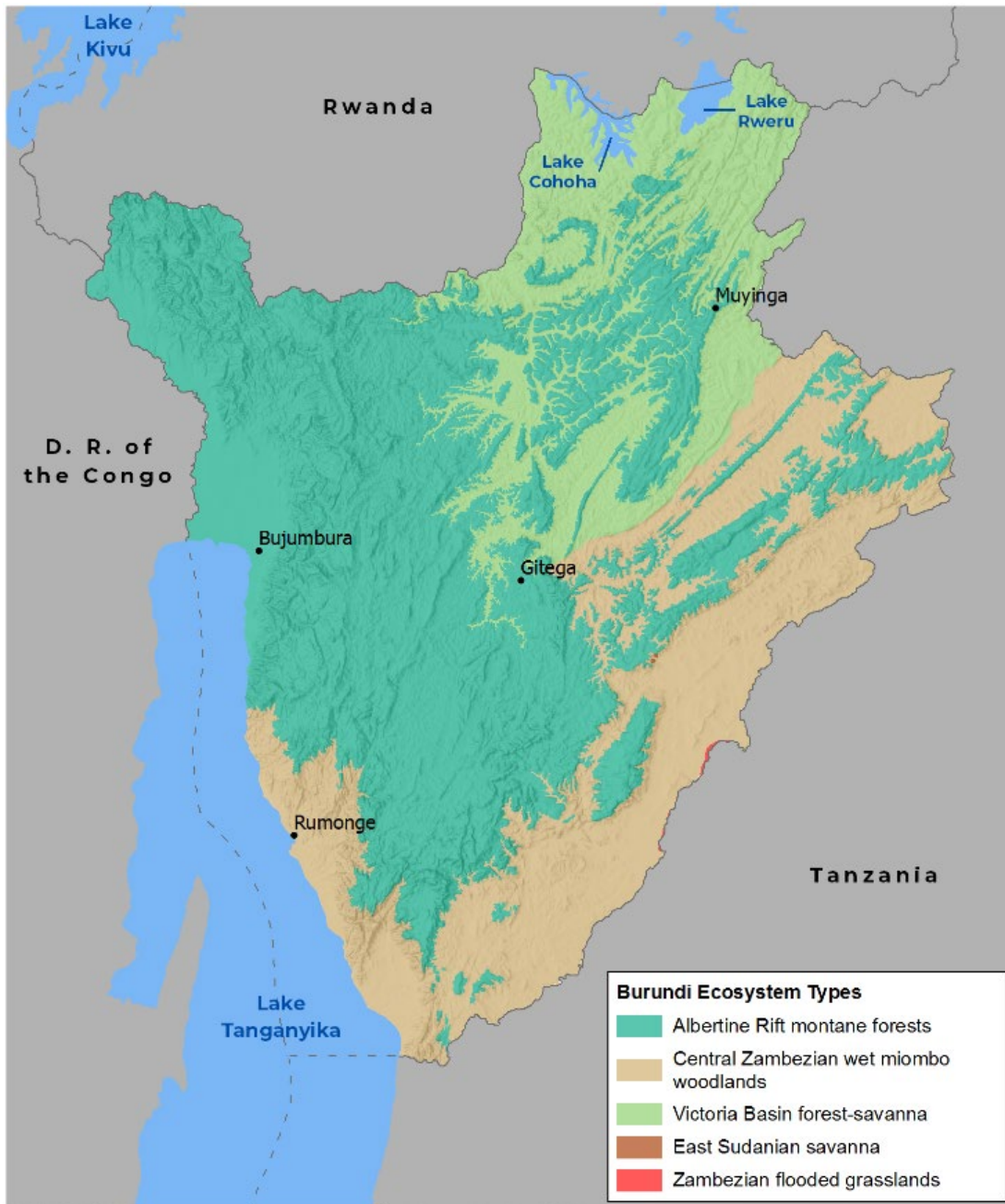


Figure 2. Ecosystems of Burundi

3.1.2 AQUATIC ECOSYSTEMS

In Burundi, aquatic ecosystems include marshes, lakes, ponds, and streams.

Wetlands

Wetlands represent some of the most productive aquatic ecosystems. They provide essential ecosystem services, such as supporting fisheries and local biodiversity as nurseries for larval fish and invertebrates and resilience to flooding. Burundi contains more than 1,180 km² of wetlands representing 5% of the land cover in the country, including both seasonally wetted and permanently wetted areas. Wetlands are concentrated around Lake Tanganyika and the Ruvubu River in the East (Burgess et al. 2004; Olson and Dinerstein 2002). The Ruvubu National Park is a Ramsar site containing extensive papyrus swamps with a high diversity of fauna; most notably Nile crocodiles and hippopotamuses. The Rusizi National Park is another Ramsar site located along the Rusizi River north of Lake Tanganyika. This site is a complex permanent inland delta that has been described as an “ornithological paradise” providing stopover and nesting sites for over 120 bird species including 90 migratory species (IUCN 2021). The flora community contains 193 species with emergent cumbungi and phragmites vegetation being common as well as submerged vegetation and water lily species. As of 2013, 12 reptile species and six species of large mammals had been identified in this habitat within Burundi including the Nile crocodile and hippopotamuses.

Numerous marshes surround the lakes and area also located along the waterways. High-altitude marshes are reported above 1,700 m altitude in the mountain forest zone surrounding the Northern Lake Region where they evolve into bogs in the high valleys. They are dominated by giant lobelia and silvergrass. The disappearance of this vegetation often gives way to plant formations with sedges. The low and medium altitude marshes are located at altitudes of 775 to 1,700 m. *Cyperus papyrus* swamps are found in a constantly waterlogged environment forming a continuous monospecific layer. At the edge of the lakes, there is also cattail, Phragmites and hippo grass vegetation on temporarily wet soils and at the northern edge of Lake Tanganyika (INECN 2014).

Lakes and Rivers

Total freshwater surface area in Burundi is estimated at 2,300 km² and divided by the Albertine Rift Mountains (Grima and Breuil 2014). Areas along the west of the country drain through the Congo River via Lake Tanganyika, and the eastern plateau areas drain through a series of lakes into Lake Victoria and eventually into the Nile River (Grima and Breuil 2014). Northeastern Burundi contains several lakes that are key to local livelihoods as well as aquatic biodiversity, including Lake Cohoha and Lake Rweru, shared with Rwanda, and Lake Rwiginda. Approximately 8% of Lake Tanganyika, which is shared with the Democratic Republic of Congo, Tanzania, and Zambia, is within Burundi’s national boundaries.

Lake Tanganyika is the second oldest, deepest, and most voluminous lake in the world (Burton and Richards 1965). Due to its long history, morphology, and location, as well as stable stratification, Lake Tanganyika is a major hub of aquatic diversity in the region. Endemic Tanganyika sardines and Tanganyika sprat represent the largest portion of fish biomass in the pelagic zone (Lindqvist et al. 1999). In addition, there are four endemic species of Lates in the lake as well as more than 250 species of cichlid (subfamily *Pseudocrenilabrinae*), 98% of which are endemic (West 2001). Although the lake has fewer cichlid species than Lakes Malawi and Victoria, Tanganyika cichlids are the most morphologically and genetically diverse

in the region (Seehausen 2015). Five species of freshwater fish, including three cichlid species, are endemic to the waters of Burundi (Fricke, Eschmeyer, and Van der Laan 2022). Lake Tanganyika is also home to Nile crocodiles, several species of terrapins, 83 species of freshwater snail, 11 bivalves, and 200 species of crustaceans, as well as other invertebrates, all of which have very high rates of endemism, above 50% for most groups (Seddon et al. 2011; West 2001; Segers and Martens 2005).

The Rusizi and Ruvubu flow through protected areas in the northwest and northeast portions of the country. The Ruvubu National Park Ramsar site in the northeast of the country consists of a permanent river surrounded by extensive marsh and savannah habitats. It is a biodiversity-rich site with 44 mammal species, 412 waterbird species, 13 reptile species, and 14 fish species. The site is known to be a very important habitat for the International Union for Conservation of Nature (IUCN) listed hippopotamus and Nile crocodile (RCS 2013e). While the area is protected, illegal activities have caused degradation even within the boundaries of the park. Local subsistence fishing, using makeshift nets or mosquito netting, has caused a reduction in fisheries production by removing many small fish without regard to preserving populations (Nkezabahizi and Manirambona 2009).

The Rusizi river flows from lake Kivu into the northern end of Lake Tanganyika descending over 750m. Hydroelectric dams have been built in the northern reaches near Lake Kivu (Lamers 1990). Rusizi National Park just north of the northern end of Lake Tanganyika is 10,673 ha of permanent inland delta, freshwater lakes, rivers, and marshes and has been protected under the Ramsar Convention. It supports 193 plant species, 90 fish species within the river ecosystem, and over 12 reptile species, including the Nile crocodile. It is a source of food and nesting ground for fishes and hosts several indigenous species. Six species of large mammals have been identified, including the IUCN listed hippopotamuses and several small mammals including the sitatunga (RCS 2013b). The lower reaches of the river where it enters Lake Tanganyika are surrounded by extensive wetlands and is home to over 220 species of birds, 45 amphibian species, over 190 specialized plant species, including numerous endemics, and 145 fish species, two of which are critically endangered (IUCN 2010). Much of the fish diversity is shared with Lake Tanganyika as this area serves as an important nursery for many fish species. Like many other protected areas, the Rusizi River is threatened by human encroachment and illegal settlement. This area, in particular, has experienced increased sediment loads due to upstream deforestation and riparian degradation (IUCN 2010).

The northern mountainous regions of Burundi boast several small lakes of ecological and sociological importance. The Northern Protected Waterway is a 62.42 km² complex of 8 permanent freshwater lakes (including Lakes Rweru, Rwihinda, Kanzigiri, Cohoha, Gacimirinda, Nyagitamo, Mwungere, and Narungaz) and marshes, forming part of the Nile basin. It is a biodiversity rich site supporting 20 fish species, including two endemic species, and functions as an important stopover ground for several migratory birds - with 60 bird species identified in one of its rivers (RCS 2013d). These lakes contain less diversity than the African Great Lakes, such as Lake Tanganyika, and are dominated by small *Tilapia* and *Oreochromis* species. (Dennison, Murray, and Booth 1989). These lakes have been the site of large-scale invasions of water hyacinth, which has vastly decreased production and reduced fish stocks, as well as crowded out native vegetation. The invasive plant is now dominant throughout the Lake Victoria Watershed (Moorhouse, Agaba, and McNabb 2001). Burundi has taken little effort to remove the invasive species, however efforts in Rwanda have shown some promise and will likely positively affect Burundi's waters, including Lake Rweru (Gu, Renwick, and Xue 2018).

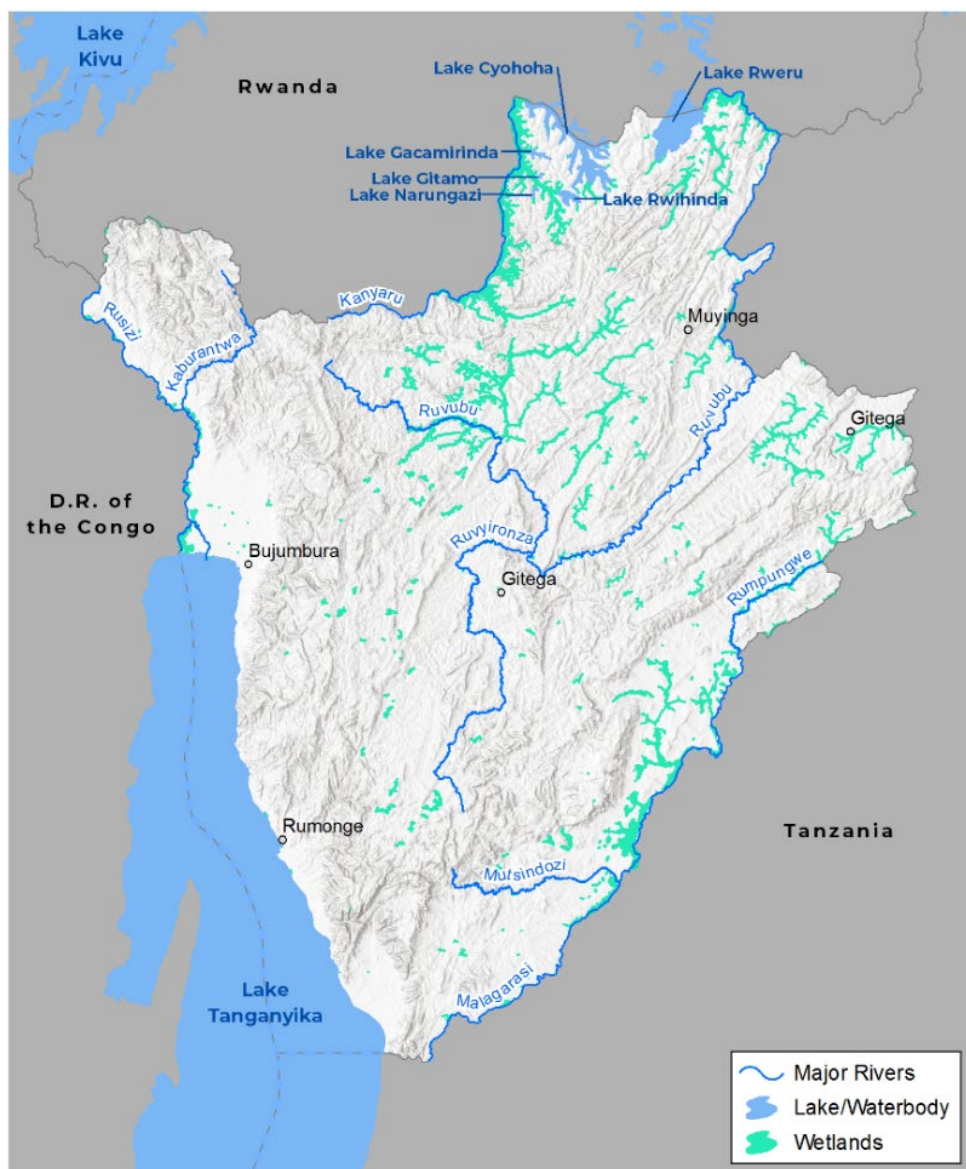


Figure 3. Water Resources of Burundi

3.2 STATUS OF TROPICAL FORESTS

As described above, there are three major categories of forests and woodlands within Burundi – Albertine Rift Montane Forest, Central Zambesian Wet Miombo Woodlands, and Victoria Basin Forest Savannah. The Albertine Rift Montane Forest is largely a tropical and subtropical moist broadleaf forest, while the Miombo Woodlands and Victoria Basin Forest Savanna are a mix of tropical and subtropical grasslands, savannas, and shrublands.

Multiple groups have attempted to measure the forest cover within Burundi. The most recent Food and Agriculture Organization of the United Nations (FAO) Forests Resource Assessment indicates that the

total forested area² of Burundi was 2,800 km² (10.9%) in 2020. Of that, primary forest³ was 1,670 km² and planted forests was 1,130 km² (FAO 2020). The previous estimate of overall tree cover⁴ in 2000 indicated 5,380 km², or 20%, cover throughout the country. Global Forest Watch's satellite imagery-based land-cover estimates in 2010 indicate 5,530 km² (21%) of overall tree cover within the country, consistent with FAO estimates from 2000 (Global Forest Watch 2020). The majority of forests occur in the western part of the country along the Albertine Rift Valley divide (See Figure 4). The Cibitoke region in the northwest of the country contains almost 20% of the nation's tree cover.

The dominant tree taxa vary across the country depending on local conditions. Data collected from the Kiriba forest within the Albertine Rift Ecoregion in 2016 indicates that trees in the *Euphorbiaceae*, *Myrtaceae*, and *Araliaceae* families were important within the forest ecosystem (D. Hakizimana, Huynen, and Hambuckers 2016). Further to the East, the habitat transitions to a flat plateau with sparse tree cover dominated by miombo, acacia, and eucalyptus trees (Appiah and Gates (Jr.) 2010).

Burundi is a landlocked, resource-poor nation that depends heavily on subsistence agriculture. Uncontrolled cutting for fuel wood and agriculture (discussed in Section 5.1) have effectively deforested the majority of the country (FAO 2017). Between 2002 and 2021, Burundi lost 3.55 km² of primary forest, representing 1.4% of total primary forest in the country. From 2001 to 2021, 318 km² of tree cover was lost, representing 5.9% of total tree cover since 2000, and 12.8Mt of CO₂ emissions (Global Forest Watch 2020). Since 2001, 7.1% of tree cover loss has resulted in deforestation primarily from encroachment in more heavily forested regions, including Bururi and Cibitoke, as well as rural areas surrounding Bujumbura (Global Forest Watch 2020). Burundi has had one of the highest rates of deforestation since colonial times, losing forests covering 34% of total land area (Land Links, 2010). Between 2000 – 2005, Burundi saw an annual deforestation rate of 5.2% (Hobbs and Knausenberger 2003; USFS 2006; World Bank 2008a; Athman et al. 2006). In total, between 1990 and 2010, Burundi lost 40.5% of its forest cover, or around 1,170 km² with the crisis starting in 1993 functioning as a major contributor (Butler 2011). Loss of these unique habitats presents an ongoing threat to the persistence of numerous endemic species that inhabit Burundi.

² FAO defines forests as areas spanning more than 0.5ha with trees higher than 5 meters and canopy cover of 10% or more.

³ "Primary forests are naturally regenerated forests of native tree species, where there are no clearly visible indications of human activities and ecological processes are not significantly disturbed (FAO 2020)."

⁴ Defined as all vegetation cover over 5 meters in height.



Figure 4. Forest Cover in Burundi (Global Forest Watch 2010)

3.3 SPECIES DIVERSITY AND STATUS

The Republic of Burundi contains terrestrial and aquatic habitats capable of supporting a wide variety of species. Despite extensive habitat loss caused by local unrest, many endemic species persist in the country. Burundi has 597 bird species, 203 mammalian species, 89 species of reptile, including the Nile crocodile, 49 species of amphibians, and over 300 species of fish, including four species of lungfish.

Due to human encroachment, poaching, and habitat loss, many large mammal species are now at risk of local or global extinction. In Burundi, the eastern chimpanzee, leopard, and the white-bellied

hippopotamus are all listed as vulnerable, endangered, or critically endangered by the IUCN. African wild dog, cheetah, and gorilla once inhabited the eastern Savannah regions and Burundi's Albertine Rift Mountain regions, but have been completely extirpated since the 1980s through habitat loss and poaching for bushmeat and valuable animal parts (Eggers 2022). According to OBPE, the last African savannah elephant in Burundi was killed in Rusizi National Park, in 2000 (INECN 2013).

Eastern chimpanzees were listed as endangered by the IUCN in March 2016. They inhabit forest and savanna ecosystems but have largely been restricted to protected areas in Burundi. As of 2013, the Kibira National Park, in the northwestern upland region, contained approximately 204 weaned individuals. (D. Hakizimana and Huynen 2013). Eastern chimpanzees also occur in smaller numbers in Bururi, Rumonge and Vyanda forest reserves, and the protected landscape of Makamba in the mountains of Rukambasi in southern Burundi (A. J. Plumptre et al. 2010). These populations are much smaller due to the sizes of these reserves with combined population estimates of 80 individuals in 1989 (Barakabuye et al., n.d.). The smaller southern populations are likely not sustainable in the long term due to their low population numbers and distance from other Chimpanzee populations. Further habitat fragmentation and poaching represent the greatest threats to the continued existence of Chimpanzees in Burundi.

Hippopotamus populations in Burundi are concentrated in protected areas surrounding the Rusizi and Ruvubu rivers with significant wetland cover. Hippopotamuses are listed as vulnerable but stable as of 2016 by the IUCN (Lewison and Pluháček 2016). Most recent estimates from the same time estimates the population size at 500-1000 individuals. While hippopotamuses spend the day in the water, they rely on terrestrial grasses as their primary food source. Aquatic habitat protection is important, but habitat degradation around Lake Tanganyika and Burundi's rivers from human encroachment represents a major threat to Burundi's hippopotamus population.

White headed vultures are listed by the IUCN as critically endangered and have been extirpated from numerous large regions of its former range. The population is declining at the extreme rate of approximately 6.7% per year (Ogada et al. 2016). The most recent estimates suggest a worldwide population of approximately 5,500 individuals. They are threatened by habitat loss throughout their range, as well as poisoning from carcasses which often goes undetected in southeastern Africa (Ogada et al. 2016).

Burundi is home to numerous endemic plant species. Many of these are in the Albertine Rift Montane Forests and include 550 or more endemic species. 181 plant species in Burundi have been listed as vulnerable or endangered by the IUCN, including trees, shrubs, grasses, macrophytes, and epiphytes. Epiphytic plants, such as *Tracheophyta liliopsida*, which rely on healthy humid forests for habitat, are widely threatened and in decline from climate change and deforestation (IUCN 2010). Aquatic plants surrounding the marshes, lakes, and rivers of Burundi are threatened by human encroachment into natural aquatic systems, water diversion for agriculture, and channelization.

Of the amphibian species residing in Burundi, one is listed as near-threatened by the IUCN, the Rugegewald river frog (IUCN 2021). This frog, like many other amphibians in Burundi, is restricted to the northwest region of the country in the montane rift rainforest and surrounding the northern end of Lake Tanganyika. The frog is rare within its range and due to the steady decrease of forest habitat in the Albertine Montane Rift, the population is likely declining.

Lake Tanganyika is not the most species-rich of the Great East African Lakes but contains the greatest diversity of cichlid fishes in the region. The Tanganyika cichlid flock is by far the oldest, stemming from a handful of species that colonized the prehistoric lake 9-12 million years ago (Koblmüller, Sefc, and Sturmbauer 2008). Since then, these few species have expanded to include over 200 species comprised of 54 different genera (Salzburger et al. 2002). Diversification was not constant with large radiations concurrent with major habitat changes, such as the establishment of lacustrine deep-water conditions 5–6 million years ago and subsequent major lake-level fluctuations since (Koblmüller, Sefc, and Sturmbauer 2008). Of these cichlid fish, many are endemic, five are listed as vulnerable, and two are endangered under the IUCN classification system. Many species are popular in the legal and illegal international aquarium trade, including threatened species. 150 species of non-cichlid fish also occur in the lake, most of which live along the coast up to a depth of about 180 meters. Most of the biomass is located in the pelagic zone and is dominated by six species: Tanganyika sardines, Tanganyika sprat, and four species of Lates.

Burundi has a high diversity of invertebrate life, including insects, arachnids, and mollusks, with numerous endemic species. Insect diversity is particularly high in the montane forest regions in the northwest of the country. Four arthropod species are listed by the IUCN as vulnerable or endangered, including the Kigoma Agile Grasshopper, which may occur in southern Burundi, and the endemic Tanganyika jewel damselfly (Rowell 2015). Three mollusk species are listed by the IUCN. Two snail species, including the endangered *Hirthis littorina*, and an endangered bivalve, *Brazzaea anceyi*, are endemic to Lake Tanganyika (IUCN 2021).

3.4 GENETIC DIVERSITY

The Burundi economy is heavily dependent on agriculture, with 90% of the population relying on it for their livelihood (USAID 2022). Farms in Burundi are typically small (<0.5ha) and oriented towards subsistence farming (Mabaya et al. 2021). There are 87 cultivated species that are grown widely in Burundi including 23 species of food crop, 10 species of cash crop, 27 species of market garden crops, 14 species of fruit plants, and 21 species of fodder for livestock, although there exists no exhaustive inventory of all cultivated species in the country. In addition, fish are farmed in various waterways and lakes, and over 23 species of medicinal plants are cultivated with wide ranging uses, from insecticide production to treatment of asthma (INECN 2014; Ministry of the Environment, Agriculture and Livestock 2020). The primary thrust of the Institute of Agronomic Sciences of Burundi (ISABU) has been to improve productivity through improving genetics of currently cultivated species to address local food scarcity.

Cultivated food plants make up 87% of the nation's agricultural production. Of particular economic importance are coffee, cotton, tea, and sugar cane, which are all regular exports. Oil palms and cassava are also grown extensively in the south of the country. Only three native plant species are still cultivated on very small scales and all three are in decline: the air potato, Malabar spinach, and black nightshade (INECN 2014). None of these plants represent major cash crops, and their cultivation is not incentivized beyond subsistence farming. These species have all been naturalized, either as agricultural or pest species in non-native regions, and are not threatened by global extinction ((Ministry of the Environment, Agriculture and Livestock 2020). Traditional knowledge regarding indigenous species used in agriculture prior to the introduction of foreign species has largely been lost, and no concerted efforts have been made to adapt native species to modern agriculture. The International Rice Research Institute has released two new varieties of rice, vuninzara and rwizumwimbu. Several other rice varieties are being

tested at ISABU, Institute of Agronomic and Zootechnical Research, and Agrobiotec (ENAB 2013). The ISABU has also introduced additional plant species for cultivation, such as *Phaseolus vulgaris* and maize, in rural areas with the goal of improving overall production. Many cultivated species enter Burundi through uncontrolled pathways threatening native species and introducing cultivated species alike with extirpation.

Burundi's livestock is made primarily of goats, poultry, and cattle. Little change has occurred in goats or poultry, but for many years the livestock sector has primarily focused on improving meat and milk production by the local Ankole breed through imported genetics. The Sahiwal breed, a larger breed, was introduced in 1953, and the Ankole-sahiwal hybrid has been a common cross type in rural areas since 1960. Several other dairy cow breeds have also been imported, including Frisonne, Montbeliard, Burne de Suisse, Jersey, and Gurnsey (INECN 2014). Beekeeping is also practiced sporadically throughout the country with the European Honeybee being the dominant honeybee (Ndayikeza et al. 2014).

Fish aquaculture was introduced to Burundi in 1950 during the colonial administration, but overall production increased rapidly after 2012 when the first floating fish aquaculture cage was installed in lake Dogodogo due to significant decreases in the catch of fish from Lake Tanganyika, a major diet component of Burundians (Zacharie et al. 2021; FAO 2022a). The Nile tilapia and African clarias catfish are the primary species that are farmed, either in hand-dug ponds or suspended net pens in lakes.

Numerous plant species are cultivated or collected for their medicinal properties in Burundi. Recently, measures have been put in place to ensure the continued existence of several of these species, including Umugombe Igicunucu, and Aloe, by setting aside 10-acre botanical gardens for their cultivation. These will be located near, and operated by, hillside cooperatives and schools, as well as in protected areas (INECN 2013).

To improve genetic diversity in Burundi, a study to identify an area to be protected in the northeast of Lake Tanganyika was included in the 2014 action plan by the National Institute for Environment and Nature Conservation (INECN). Other studies are planned for the Inanzegwe-Kibimbi, Nkoma, Birime, Mpungwe, and Murore mountain ranges and coastal areas around Lake Tanganyika (INECN 2014). In order to conserve forest species diversity, a cold room seed bank is maintained by the Ministry of Water, Environment, Land Use Planning, and Urban Development as ex-situ conservation areas, including woodlands, seed stands, and arboretums. The ISABU is tasked with ensuring the availability of certain important seeds, such as corn, potato, and wheat, and various professional producers cultivate seeds for commercial sale (Ministry of the Environment, Agriculture and Livestock 2020).

3.5 STATUS AND MANAGEMENT OF PROTECTED AREAS

Protected areas are clearly defined geographical spaces, recognized, dedicated, and managed through legal or other effective mechanisms to achieve the long-term conservation of nature with associated ecosystem services and cultural values (Dudley 2008). Burundi's protected areas network is managed by the OBPE and governed by the law relating to the creation and management of protected areas in Burundi (Fofu et al. 2022). The OBPE has the authority to 1) create national parks and wildlife reserves; and 2) set the rules for the management and protection of protected areas in Burundi (Fofu et al. 2022). In addition to OBPE, local communities are empowered to support protected areas management, though resources for local programming are lacking.

Stakeholders, donors, and community members note the lack of capacity to manage protected areas and reserves and consider improved management a high priority for conservation of Burundi’s remaining biodiversity (World Bank 2018). Various institutional, legal, geographical, technical, and financial factors constrain the management of protected areas. Institutional constraints include a lack of consideration of protected areas in sector policies and planning, making implementation and management of protected areas difficult (Fofo et al. 2022). Despite laws to protect ecosystems and resources, limited legal action has been taken to curb encroachment (Fofo et al. 2022). Effective management of transboundary landscapes is also a challenge as laws, enforcement capacities, and levels of coordination between OBPE and protected area management authorities differ in Rwanda, Tanzania, and Democratic Republic of Congo (Fofo et al. 2022). Increased agriculture, expansion of farming, and population growth have exacerbated the risks associated with improper land management, such as increased erosion and encroachment into nearby protected areas. The lack of buffer zones, fragmentation, and lack of capacity to address encroachment pose the most serious risks to the protected areas (Fofo et al. 2022).

Burundi has fourteen protected areas, managed by OBPE, which cover 5.6% of the total national territory (INECN 2014). The country also has several community and private protected areas, a sacred forest, and two arboretums. Burundi’s protected areas are made up of different categories based on IUCN’s protected areas’ definitions.

Currently, Burundi has fifteen protected areas divided into four IUCN categories:

- National Parks
- Nature Reserves
- Natural Monuments and
- Protected Landscapes (INECN 2014).

TABLE 2. PROTECTED AREAS		
PROTECTED AREA	IUCN CATEGORY	SIZE (KM ²)
Rusizi	National Park	106.7
Kibira	National Park	400
Ruvubu	National Park	508
Rumonge-Vyanda	Nature Reserves	510
Kigwena	Nature Reserves	9
Bururi	Nature Reserves	33
Monge	Nature Reserves	50
Karera Falls	Natural Monuments	4.5
Nyakazu Faults	Natural Monuments	6
Gisagara	Protected Landscapes	61.3
Mabanda-Nyanza Lac	Protected Landscapes	17.3
Mukungu-Rukambasi	Protected Landscapes	23.6

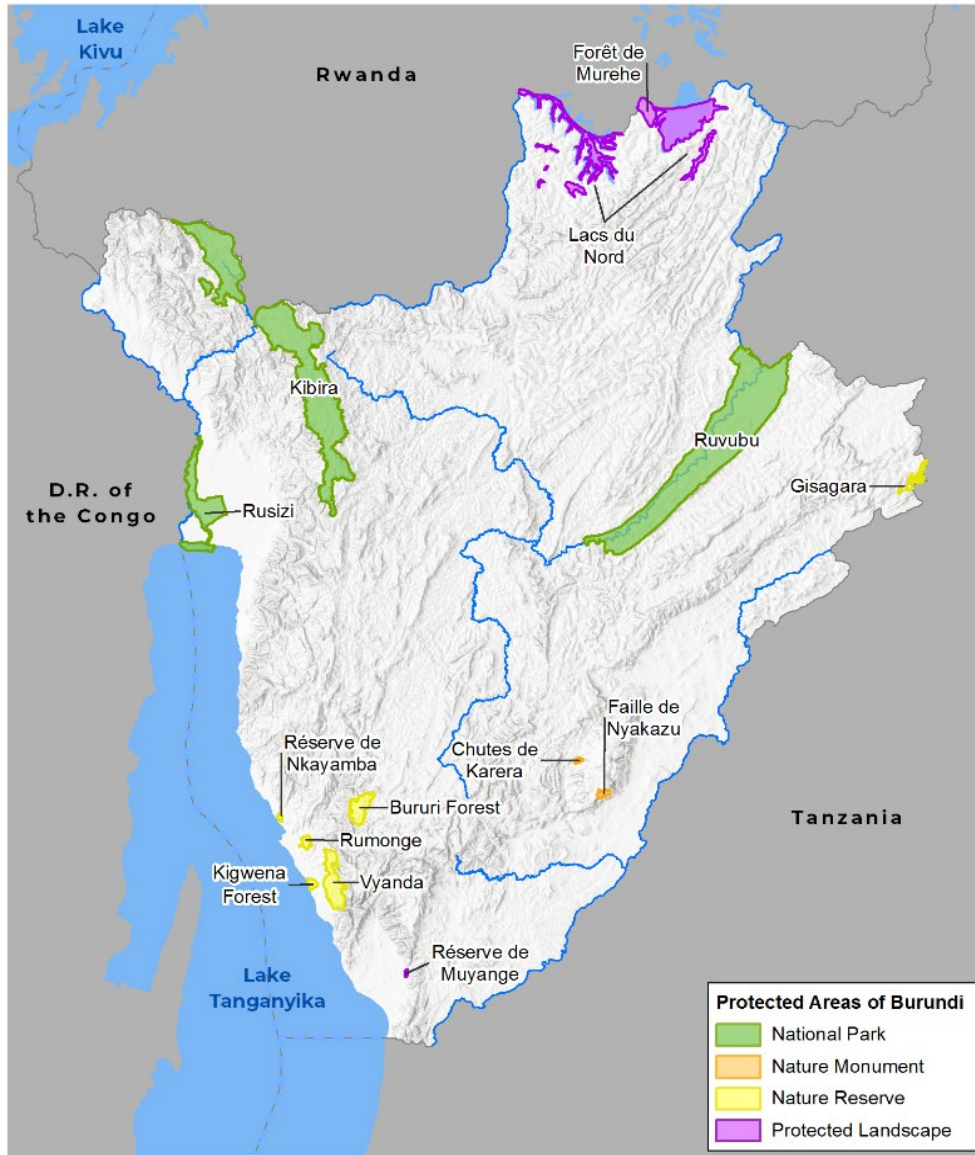


Figure 5. Map of Burundi's Parks and Protected Areas

In Burundi, a national action plan has been developed to preserve priority sites in line with the Convention on Biological Diversity's (CBDs) Fifth National Report (INECN 2014). Stakeholders and local actors note that Ruvubu and Kibira National Parks are priority local ecosystems, targeted by various environmental management projects, and four wetlands are new to the Burundian Ramsar Convention framework (SCBD 2021). Despite progress, Burundi's protected areas suffer from weak data inputs for effective management planning, poor management strategy implementation, and lack the well-organized biological resource management processes necessary for effective conservation (Fofu et al. 2022). In addition, the lack of protection around Lake Tanganyika and other nearby aquatic and wetland areas are a priority conservation concern (SCBD 2009).

Nature Reserves: The aim of nature reserves is to protect natural resources for the primary purpose of retaining the wild, natural state. Burundi has six designated Nature Reserves. Rumonge and Nkayamba

are jointly managed and face pressures, such as extraction of resources (Fofo et al. 2022). Created by a decree in 1980, Vyanda Reserve is in the east of the country and is characterized by a forest miombo and mountain forest. Kigwena is a forest perished Guinean farm, which borders the critical ecosystem, Lake Tanganyika (Fofo et al. 2022). Bururi Forest Nature Reserve extends over a mountainous rainforest and includes species of a rare frog, the Bururi long-fingered frog (Fofo et al. 2022). Malagarazi is both a Nature Reserve and Ramsar site, with key species, such as water birds and hippopotamuses. Nature Reserves face pressures, such as encroachment and poaching (Fofo et al. 2022).

National Parks: Burundi's national parks are managed and run by the OBPE. Where nature reserves can be either public land or privately owned, all national parks are government owned and run (FAO 2022b). Established to preserve exceptional natural regions and landscapes without human interference, no hunting or extractive uses (such as mining) are allowed in the parks (Fofo et al. 2022). The three national parks, Ruvubu, Kiriba, and Rusizi, receive the highest priority protection in Burundi with surveillance patrols (Fofo et al. 2022). However, management and laws in the national park are not fully applied, and communities are only weakly involved in the management.

Natural Monuments: Natural monuments protect and preserve elements of nationally important natural characteristics. The two monuments, Karera Falls and Nyakazu Faults, are tourist attractions, drawing visitors to visit waterfalls and faults (Fofo et al. 2022). Both require limited resources for maintenance, but management is still underfunded and understaffed.

Protected Landscapes: Burundi has three protected landscapes: Gisagara, Mabanda-Nyanza Lac, and Mukungu-Rukambasi. Protected landscapes are the least stringent protected area, which gives the public the ability to enjoy the areas through recreation and tourism. As these are the least managed protected areas, landscapes are particularly threatened by deforestation, agricultural expansion, and bush fires (Fofo et al. 2022).

3.5.1 INTERNATIONAL DESIGNATIONS FOR PROTECTED AREAS

United Nations Educational, Scientific and Cultural Organization (UNESCO-Man and the Biosphere Reserve and World Heritage Sites: Burundi has no UNESCO World Heritage sites. However, there are ten sites on the Tentative List for consideration: 1) La résidence royale du Burundi (Le cas de Gishora); 2) Le rugo traditionnel du Mugamba; 3) Les paysages naturels sacrés de Muramvya, de Mpotsa et de Nkiko-Mugamba; 4) Gasumo, la source la plus méridionale du Nil; 5) Rwhinda, lac aux oiseaux; 6) Le lac Tanganyika; 7) La réserve naturelle de la Rusizi; 8) Le parc national de la Kibira; 9) Le parc national de la Ruvubu; and 10) Les chutes de la Karera et la faille de Nyakazu (UNESCO 2022).

Ramsar Wetlands of International Importance: Party to the Ramsar Convention on Wetlands since 2002, Burundi has designated four Ramsar Wetlands covering 785 km² (RCS 2013a). Domestic protections of these wetlands are covered by the same law that governs national parks and protected areas, reinforced by the Environment and Forest Codes. The four designated wetlands are Ruvubu National Park, Malagarazi Nature Reserve, Northern Protected Waterscape, and Rusizi National Park (RCS 2013a). Despite Ramsar designations, both stakeholders and the OBPE note the lack of representation of aquatic ecosystems and marshes in the protected areas designation (Fofo et al. 2022).

3.5.2 OTHER AREAS OF RECOGNIZED VALUE

Important Bird Areas (IBAs): Birdlife identifies five IBAs of international significance, all of which are in protected areas (African Bird Club 2013). The IBAs cover 3.7% of the country and 1,018 km². Three of the IBAs are in National Parks and the other two in Nature Reserves. The five IBAs are characterized by three different habitats: montane forest, wetlands, mixed savanna woodlands and wetlands (African Bird Club 2013).

3.6 STATUS AND MANAGEMENT OF KEY NATURAL RESOURCES OUTSIDE OF PROTECTED AREAS

Approximately 80% of land coverage in Burundi is used for agriculture. The historically occurring ecosystems described above (section 3.1) and in Table 3 have largely been converted. Population growth and reliance on farming have led to increased deforestation outside of protected areas (World Bank 2018). Table 3 demonstrates that very little of the original vegetation present remains conserved in protected areas. At present, only 10% of aquatic ecosystems are protected, a statistic of particular concern given the fertility of the nearby soil, which makes it an attractive area for agricultural expansion (SCBD 2009). The Zambezi-type woodlands have experienced intense decline outside protected areas with thousands of hectares cleared for agriculture (SCBD 2009). The savannahs are also undergoing a regressive evolution, both inside and outside protected areas. In addition, Lake Tanganyika is a prime example of a critical ecosystem that is not well-protected, despite its regional importance (SCBD 2009).

Table 3 below represents current available information regarding ecosystems conserved within protected areas in Burundi, with the remainder falling outside protected areas and largely considered converted.

ECOSYSTEM	AREA (KM ²) WITHIN PROTECTED AREAS	PROPORTION OF HISTORIC ECOSYSTEM WITHIN PROTECTED AREAS
Albertine Rift montane forests	687	5%
Central Zambezi wet miombo woodlands	694	7%
Victoria Basin forest-savanna	286	6%
Zambezi flooded grasslands	0	0%
Large water bodies	137	7%

3.7 OVERVIEW OF ECOSYSTEM SERVICES

Ecosystem services are the aspects of ecosystems utilized (actively or passively) to produce human well-being (Fisher, Turner, and Morling 2009). Aspects of ecosystem services can include goods, such as food, fuel, and fiber; or services, such as carbon sequestration (IPBES 2017). In seeking to understand and characterize the values provided by ecosystem services, economists typically classify these services into three categories: provisioning services, cultural services, and regulating services.

Provisioning services arise from the direct use of goods, such as food, fuel, water, timber, non-timber forest products, medicine, and raw materials. Cultural services result from meaningful interactions that

people have with ecosystems, which include outdoor recreation, aesthetic enjoyment, education, and the intrinsic spiritual value of land. Regulating services are outputs from the normal functioning of ecosystems that benefit people in both direct and indirect ways, such as the regulation of climate, air and drinking water quality, soil formation and retention, moderation of extreme events, and biological control. Supporting services underlie these three ecosystem service categories through extremely long-time horizons and broad-scale processes, such as soil creation and nutrient cycling (see Figure 5). Biodiversity is critical to the provision and long-term maintenance of these ecosystem services (Balvanera 2016; Harrison et al. 2014). High-biodiversity areas provide over half of the ecosystem services on which the global poor depend, and conservation of those areas has an outsized effect: conserving the top 25% of the world’s high-biodiversity areas could provide 56–57% of the total potential ecosystem goods and service benefits (Turner et al. 2012).

This section describes some of the key ecosystem goods and services that provide value to Burundi, broken down by the categories of provisioning services, cultural services, and regulating services.

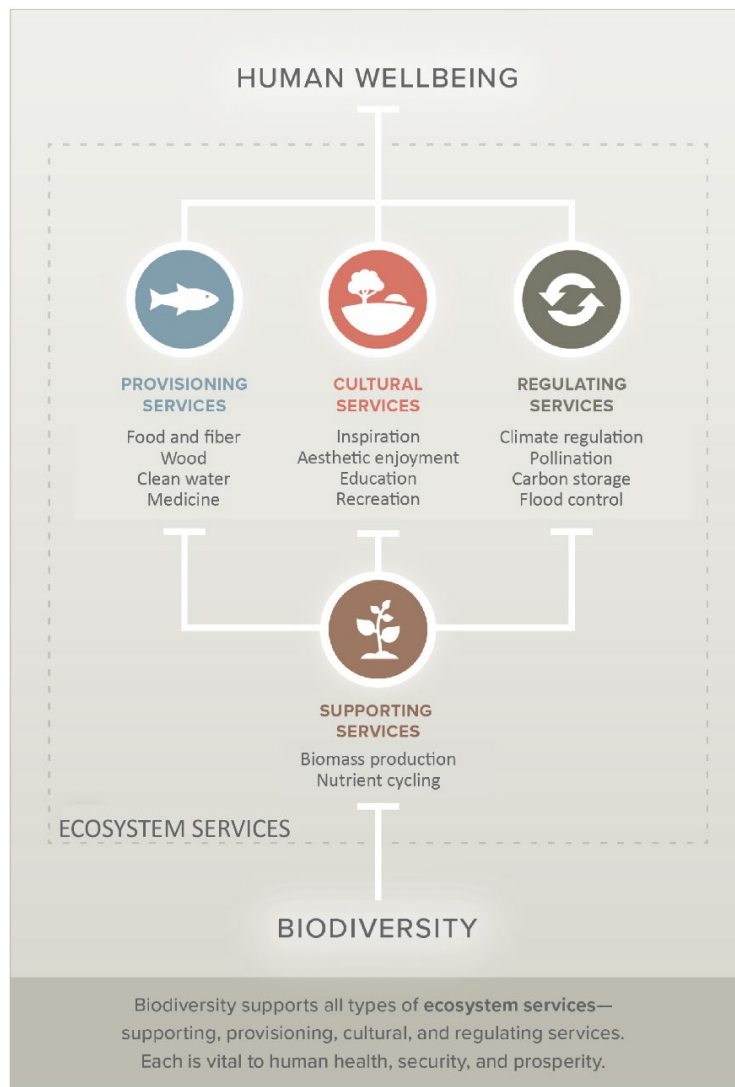


Figure 6. Ecosystem Services

3.7.1 PROVISIONING SERVICES

Burundi has a total land area of 25,680 km², and approximately 73.3% (18,823 km²) of this total is used for agricultural purposes (CIA 2022). In 2020, Burundi's total Gross Domestic Product (GDP) was \$8.69 billion (\$700 per capita, one of the lowest in the world) with the agriculture sector accounting for 40% (\$3.47 billion) of this total (CIA 2022). The livelihood of much of the population is highly dependent on agriculture, with roughly 90% of the country's population employed by the agricultural sector (CIA 2022). Burundi's main agricultural products are cassava, bananas, sweet potatoes, plantains, beans, vegetables, potatoes, cashew nuts, maize, and taro, and more than half of foreign exchange earnings are from its primary exports: coffee and tea (CIA 2022). In 2020, Burundi's highest producing crop was cassava (2.43 million tons), which was followed by bananas (1.28 million tons) and sweet potatoes (950 thousand tons) (FAO 2022c).

In 2020, roughly 10.9%, approximately 2,800 km², of Burundi's total land cover was forest (FAO 2020), including Afromontane forest types and miombo woodlands as well as unique palms (USAID 2010). Burundi's forests provide at least \$44.9 hectares per year in ecosystem services, including the value from hunting and fishing and non-wood forest products, excluding the value of wood production, and benefits to air pollution, water harvesting, and certification, capacity, improved park quality, increased value of livestock production, and flood reduction (World Bank 2018). Burundi's forests and ecosystems also provide medicinal plants to local communities (Ndayizeye et al. 2020). For example, African cherry is used by pharmaceutical companies against benign prostatic hyperplasia (Ndayizeye et al. 2020). Approximately 90% of household energy requirements are satisfied by burning wood, charcoal, or peat, with wood as the primary source of fuel for cooking (African Energy Commission 2022).

Water is also an essential resource in Burundi as it supports aquaculture, fisheries, and hydropower. Lake Tanganyika is a vital body of water, making up 95% of Burundi's water surface area (FAO 2018). Lake Tanganyika is home to the most important fishery in Burundi that accounts for 66% of total fish exports and is shared with Democratic Republic of the Congo, Zambia, and Tanzania (FAO 2018). Lake Tanganyika is threatened by climate change and anthropogenic pressure that has resulted in impacts to fisheries, water quality, and biodiversity, which continue to decrease ecosystem services in Burundi (Plisnier et al. 2018). Specifically, the lake experienced a 60% decline in fishery production between 2002 and 2009 that has been found to be partially driven by climate warming (Cohen et al. 2016). Burundi's total capture from fisheries was 20.3 thousand tons and total aquaculture production reached 1.5 thousand tons in 2019 (FAO 2018). The fisheries and aquaculture sector in Burundi is largely subsistence level, with an estimated 300,000 people at least partially dependent on fisheries (FAO 2018). Water in Burundi provides valuable hydropower for local populations. The nation has a currently installed hydropower capacity (as of 2015) of 33.84 megawatt (49.8 % of total energy capacity) (UNIDO 2016; CIA 2022), with an additional 60 MW of planned hydropower projects (Jiji, Mulembwé, and Kaju) (IRENA 2018a).

3.7.2 REGULATING SERVICES

Burundi forests and lakes are home to thousands of bird species, chimpanzee populations, buffalo, Sangala, cichi fishes, crocodiles, hippos, and many other animal species (USAID 2010). Burundi's forests provide benefits to air pollution, water harvesting, and certification capacity, improved park quality, increased value of livestock production, and flood reduction (World Bank 2018). Burundi's grasslands and forests provide carbon sequestration services. Grasslands store an estimated 3 to 93 million metric

tons of carbon⁵ based on neighboring country rates of grassland carbon sequestration (Tessema et al. 2020), montane forests store an estimated 2.3 million metric tons of carbon⁶ (Cuni-Sanchez et al. 2021), and natural forests store an estimated 1.7 million metric tons of carbon⁷ (FAO 2017; Mendelsohn, Sedjo, and Sohngen 2012).

Additionally, Burundi's 4 Ramsar sites provide regulating services, such as water filtration, provisioning of habitat for native species, erosion control, nutrient cycling, and soil formation. One Ramsar site, the Rusizi delta, is an important site for migratory waterbirds, supports 193 plant species, 90 fish species, over 12 reptile species, and provides hydrological functions, like sediment trapping (RCS 2013b).

3.7.3 CULTURAL SERVICES

Forests and lakes not only play a significant role in the provisioning of supporting services, but they also are vital to the interactions of Burundians with their home. Forests are sacred to local communities, with communities feeling a strong place identity in relation to cultural identity, social responsibility, and a link to family history and ancestors (Ndayizeye et al. 2020). The Kibira forest is also home to past culturally important ceremonies, such as the burial site of Burundian kings, annual hunting rituals, and place of worship for traditional rituals (Ndayizeye et al. 2020). Lakes provide recreational opportunities to Burundians, with Lake Tanganyika as a source of recreation and tourism (USAID 2010). Due to recent unrest, Burundi's ecosystems (3 national reserves, Lake Tanganyika, and natural forests) are largely untapped to potential ecotourism and tourism. These ecosystems have the opportunity to benefit Burundians through ecotourism and sustainable tourism (Novelli, Morgan, and Nibigira 2012).

4 LEGAL FRAMEWORK AFFECTING CONSERVATION

4.1 NATIONAL LAWS, POLICIES, AND STRATEGIES

Burundi has a long-standing legal framework for natural resource and environmental management. In Burundi, the protection of forests and biodiversity is led by the Ministry of Environment, Agriculture, and Livestock (Development Bank of Southern Africa 2021). The environment-specific mission is outlined in the decree No. 100/087 of July 26, 2018 on the organization of the Ministry of the Environment, Agriculture and Livestock, which sets out the purpose of and actions required by the Ministry (FAO 2022b). To manage natural resources and the environment, Burundi has critical legal tools, the most important of which are: the National Constitution, the Environmental Code (2000), the Forestier (1985), and the Decree delimiting a National Park and four Nature Reserves (2000).

Currently, the Burundian government is working on reforms, such as updating and implementing the land law and the law on the creation and management of protected areas; drafting the law on incentive measures for the maintenance of the integrity of protected areas; the elaboration of the Spatial Planning and Urbanism Code; and amendments to the law on succession. Recent revisions to the Environment,

⁵ Calculated by multiplying Burundi's estimated hectares of grassland by the per hectare carbon sequestration rate in East African grasslands.

⁶ Calculated by multiplying Burundi's estimated montane hectares by the mean aboveground carbon estimates for montane forests in Burundi

⁷ Calculated by multiplying Burundi's estimated natural forest hectares by a tropical forest carbon sequestration tons per hectare estimate.

Forest, and Water Codes have increased the Republic of Burundi's legal capacity to regulate conservation; however, challenges to implement recent law and policies related to environmental programming remain (Development Bank of Southern Africa 2021). Key governmental institutions lack resources - both human and financial - to support implementation of projects and programs (Development Bank of Southern Africa 2021). As the priority of the government and its main donors is food security for the population, the budget allocated to the environment sector is modest.

The key legislative, institutional, and policy frameworks that govern natural resource management in Burundi are outlined in Table 4.

TABLE 4. LAWS AND POLICIES GOVERNING BIODIVERSITY AND FOREST RESOURCE MANAGEMENT	
LAW/POLICIES	MAIN THEMES AND PROVISION
Law No. I-10 of 30 May 2011 on the creation and management of protected areas in Burundi	The law established the conditions for the creation of the legal regime of Burundi's protected areas.
Law n°1/02 of 26 March 2012 on the water code in Burundi	The law aims to ensure the sustainable management of water resources in such a way as to allow, on the one hand, its conservation and protection against all forms of degradation, both qualitative and quantitative, and nuisances, and on the other hand, its rational use and exploitation in accordance with the different needs and priorities of the State, local communities, natural or legal persons carrying out activities on the territory of Burundi as well as any other person residing there
Law No. I-02 on the Forest Code (1985); and Law No. I/07 revising the Forest Code (2016)	This law outlines the overarching Forest Code, which concerns seven key titles considering (I); Individual afforestation (II); Conservation of forests, afforestation, and land to be afforested in general (III); Repression of offenses (V); Protection forests, forest reserves, erosion control (V); Reforestation perimeters (VI); Final provisions (VII). The 2016 revision emphasizes the practice of sustainable forest management. The revision establishes the regime applicable to the development, conservation, exploitation, and development of forest resources throughout the national territory.
Law No. I/010, Environmental Code (2000), Law n°1/09 of 25 May 2021 modifying the environmental code of the Republic of Burundi	The code lays down the fundamental rules of environmental management and safeguarding natural resources. The code is integral to the National Strategy for the Environment in Burundi. The 2021 update fixes the fundamental rules intended to allow the management of the environment and the protection of this one against all the forms of degradation finally to safeguard and develop the rational exploitation of the natural resources, to fight against the various forms of pollution and nuisance and to improve thus the living conditions of the human being in the respect of the balance of the ecosystems.
National Environment Strategy and Action Plan of Burundi (1997)	This plan is a coherent tool to amplify actions in favor of the restoration of the environment and the efficient management of natural resources. It aims for sustainable development through the rational use of environmental resources that meet the needs of present and future generations.
National Adaptation Plan of Action (NAPA) to Climate Change (2007)	The NAPA details Burundi's climate risks and vulnerabilities across sectors, including threats to ecosystems and biodiversity.

TABLE 4. LAWS AND POLICIES GOVERNING BIODIVERSITY AND FOREST RESOURCE MANAGEMENT

LAW/POLICIES	MAIN THEMES AND PROVISION
National Climate Change Policy (2012)	The climate policy is the framework of reference for the integration of climate change in all sectors of socio-economic life. This policy is built around the vision that the “State promotes development resilient to the harmful effects of climate change.”
National Forest Policy of Burundi (2012 - 2025)	The Forest policy aims to ensure the sustainability of existing forest resources to meet the needs of the forest sector, in line with the 2025 vision.
National Strategy and Action Plan for Biodiversity (2013 - 2020)	Operationalized through the Biodiversity Integration Sector Plan, the plan encourages the involvement and commitment of stakeholders in conservation.
Burundi National Development Plan (2018-2027)	Overarching development policy based on the pillars of structural transformation of the national economy. The five strategic orientations are 1) human capital development; 2) protect the environment and adapt to climate change; 3) strengthen governance; 4) mobilize resources; and 5) strengthen food security.
National Plan for Drought Control in Burundi (2020)	A national cross-sectoral plan for Burundi aimed at setting up a functional system to deal with the problem of drought and to reduce the country's vulnerability to drought by taking account of vulnerable groups including women and children.
National Strategy for the Conservation of Protected Areas in Burundi (2022-2032)	Improve the management of PAs and advocate for the mobilization of the necessary funding for the implementation of conservation actions.

Source: (FAO 2022b)

Burundi is experiencing major changes in the areas of administrative and economic governance. The primary challenge to environmental management is related to the structure of the national economy. Burundi's National Development Plan (PND) 2018-2027 responds to these economic challenges and commits the Republic of Burundi to (i) strengthening self-sufficiency and export diversification through the promotion of agro-industrial, commercial and extractives; (ii) development the energy sector; (iii) construction and maintenance of infrastructure; (iv) improvement of access to basic social services, (v) continuation of environmental protection and land-use planning programs; (vi) improvement of financial governance and decentralization; and (vii) development of regional and international partnership (Republic of Burundi 2018).

Continuation of environmental protection and land-use is a key component of the National Development Plan (Republic of Burundi 2018). The PND sets out the development of twelve provincial and five master plans for land use. In addition, the Plan considers inclusion of an inventory of protected lands, measuring demarcated state-owned lands to ensure minimal encroachment, and an inventory on reforested land (Republic of Burundi 2018). While these positive changes in land use management have been set out by the PND, challenges that remain include (i) compensation for the populations in the targeted zones; (ii) promotion of villagization; (iii) development of a land use policy; and (iv) the promotion of decent housing (Republic of Burundi 2018).

The Ministry of the Environment, Agriculture, and Livestock's OBPE has recently issued a Strategic Framework for Environmental and Social Management (2020) (Ministry of the Environment, Agriculture and Livestock 2020). The framework decrees that the OBPE ensure compliance with the Water Code,

Forest Code, and Environment Code, as well as enforce environmental safeguards to protect areas rich in biodiversity. The Office’s Environmental and Social Management Framework includes mechanisms to promote the facilitation of environment and social concerns into the process of design, planning, implementation, and monitoring of projects implemented by the Office (Ministry of the Environment, Agriculture and Livestock 2020). This 2020 Framework similarly requires stakeholder input to provide oversight and implementation support to environmental management.

Despite several recent national strategies and action plans to address biodiversity, Burundi's Fifth National Report to the Convention on Biodiversity notes limited operational programs to measure the progression of the environmental policies (INECN 2014). In addition to recent conservation policy, updates to the legal code reinforce the commitment to conservation by the Republic of Burundi. However, programs to ensure implementation are lacking. OBPE acknowledges these gaps and is actively engaging tools to implement the strategy, which inspired the Aichi Targets for 2015 – 2020 (INECN 2014).

4.2 INTERNATIONAL AGREEMENTS

Burundi has been a signatory to various international treaties, agreements, and conventions related to forests and biodiversity. These conventions and agreements are aimed at halting environmental degradation and improving the sustainable use of natural resources. While the agreements are intended to promote collective action, the lack of financial support to the environment hinders implementation of international agreements in Burundi (SCBD 2009). Food security and agriculture are frequently prioritized in the Ministry of Environment, Agriculture, and Livestock, and limited funds are allocated to the environment sector. Despite the ratification of many international conventions and national laws on environmental protection, capacity for enforcement, and funding levels remain low in OBPE. In addition, Burundi lacks the key administrative efforts to ensure progress on international targets. Key indicators, ecosystems management approaches, and public involvement in management of protected areas would all be required for successful implementation.

The primary international conventions related to natural resource use and management that Burundi is a signatory to are noted in Table 5.

TABLE 5. INTERNATIONAL ENVIRONMENT CONVENTIONS	
INTERNATIONAL CONVENTION	BURUNDI’S STATUS (RATIFIED/PARTY)
The International Convention for the Plant Protection	Ratified
The Convention on International Trade in Endangered Species of Wild Fauna and Flora	Ratified
The Cartagena Protocol	Ratified
Basel Convention – Control of Transboundary Movements of Hazardous Wastes	Ratified
Stockholm Convention on Persistent Organic Pollutants	Ratified
Paris Convention for the Protection of the World Cultural and Natural Heritage	Ratified
Sanitary and Phytosanitary Agreement – Agreement on the Application of Sanitary and Phytosanitary Measures	Ratified
Vienna Convention for the Protection of Ozone Layer	Ratified
Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal	Ratified

TABLE 5. INTERNATIONAL ENVIRONMENT CONVENTIONS

INTERNATIONAL CONVENTION	BURUNDI'S STATUS (RATIFIED/PARTY)
Protocol)	
UN Framework Convention on Climate Change	Ratified
Kyoto Protocol	Ratified
Nagoya Protocol	Party
UN Convention on Biodiversity (CBD)	Ratified
Ramsar Convention	Ratified
The Convention for the Protection of Migratory Species	Ratified
UN Convention to Combat Drought and Desertification	Ratified

Burundi participates in numerous **Regional Multilateral Agreements**, including the following key agreements:

- African Convention on the Conservation of Nature and Natural Resources.
- Treaty on the conservation and sustainable management of forest ecosystems in Central Africa and establishing the Central African Forests Commission (COMIFAC).
- Convention on the Sustainable Management of Lake Tanganyika.
- Agreement establishing the organization for the management and development of the Kagera River Basin.
- Agreement on the Nile River Basin Cooperative Framework.
- The East African Community Establishment Treaty.
- The Economic Community of Central African States.
- Statutes of the African Biotechnology Agency.
- Zoosanitary Convention between the Member States of the Economic Community of the Great Lakes Countries.
- Pact on Security, Stability and Development in the Great Lakes Region.
- African Union Convention on Preventing and Combating Corruption.
- Great Lakes Countries Economic Community (CEPGL) (FAO 2022b).

4.3 GOVERNMENT AGENCIES

The Government of Burundi (GOB) has one primary government institution related to biodiversity conservation, with several offices that fall under the Ministry of Environment, Agriculture, and Livestock. Prior to 2018, all environmental concerns fell to the Ministry of Water, Environment, Land Use Planning, and Urban Development (Development Bank of Southern Africa 2021). After a reorganization of ministries, environmental regulation became the responsibility of the Ministry of Environment, Agriculture, and Livestock. The primary office for environmental protection is the OBPE, which sits under the Ministry of Environment, Agriculture, and Livestock. While some of the biodiversity-related policies are strong, weaknesses in this structure can include a lack of coordination across the directorates and limited implementation capacity (Development Bank of Southern Africa 2021). As a primary development objective in Burundi is food security, agriculture is prioritized over environment, now that both offices merged into one Ministry.

Ministry of Environment, Agriculture, and Livestock

Six directorates are under the ministry:

- Environment, Agriculture and Livestock Farming Planning
- Self-development and Agricultural Extension
- Agriculture
- Livestock farming
- Environment, Water Resources and Sanitation
- Resources

Burundian Office for the Protection of the Environment (OBPE)

In the ministerial reorganization, the National Institute for Environment and Nature Conservation became the OBPE, which sits under the Ministry of Environment, Agriculture, and Livestock and is primarily responsible for enforcing all environmental protection legislation (Development Bank of Southern Africa 2021).

Ministry of Energy and Mines

The Ministry of Energy and Mines is responsible for managing energy development in Burundi. In addition to the Environment Code and the environmental impact assessment (EIA) decree, the Mining Code requires that all mining operations protect the environment. The Ministry of Energy and Mines works with the Ministry of Environment, Agriculture, and Livestock on the environmental assessment process and managing the environmental impact of the mining sector.

Lake Tanganyika Authority

The Lake Tanganyika Authority was established by the governments of Burundi, Democratic Republic of Congo, Tanzania, and Zambia. The authority promotes the regional, sustainable management of the natural resources in the Lake Tanganyika basin. Partner organizations supporting the Lake Tanganyika Authority include the United Nations Development Programme (UNDP), Global Environment Facility (GEF), African Development Bank, FAO, Nordic Development Fund, IUCN, United Nations Environment Programme (UNEP) and Nanjing Institute of Geography and Limnology Academy of Sciences.

4.4 CONSERVATION INITIATIVES

Burundi has numerous ongoing conservation initiatives with a focus on forestry management and biodiversity. There is substantial investment in Burundi in support of landscape restoration and biodiversity conservation by the World Bank, European Union, UNDP, GEF, International Organization for Migration, and FAO. Donor support in the forestry sector has targeted a range of issues, including sustainable production, climate change impacts on forestry, forest management and resource development, institutional capacity building, data collection and scientific analysis, governance (including policy and institutional reforms), and biodiversity conservation. The ongoing conservation initiatives by donors in Burundi are documented in Table 6.

TABLE 6. CONSERVATION INITIATIVES BY DONORS IN BURUNDI

PROGRAMME /PROJECT	OBJECTIVE(S) AND IMPLEMENTING INSTITUTION	IMPLEMENTING AGENCY/DONOR PARTNER
Burundi Landscape Restoration and Resilience Project	The Landscape Restoration and Resilience project supports communities in restoring degraded landscapes and intensifying sustainable land management practices for more resilient food production and strengthened value chains. This program promoted measures to increase crop yields and production, while reducing conversion and degradation of forests. Primary interventions will concern coffee cultivation hills near Kibria National Park.	World Bank/FMNR/GEF
Food-Integrated Approach (IAP): Fostering Sustainability and Resilience for Food Security in Sub-Saharan Africa - An Integrated Approach (IAP-PROGRAM)	Support for sustainable food production and improved food security and climate resilience in the highlands of Burundi.	Multi-donor (FAO, GEF, International Fund for Agricultural Development)
Regional Project for Integrated Agricultural Development in the Great Lakes	Increase agricultural productivity and commercialization in targeted areas within the beneficiary's territory and strengthen regional integration in the agricultural sector and respond immediately and effectively to eligible crises or emergencies	World Bank
Global Biodiversity Framework Early Action Support	The Global Biodiversity Framework provides financial and technical support to GEF-eligible Parties to the CBD in their work to review and align their national targets, NBSAPs, policy frameworks, monitoring frameworks and finance with the Global Biodiversity Framework.	UNEP
Biodiversity conservation, sustainable land management, and enhanced water security in Lake Tanganyika basin	To enhance transboundary cooperation and SAP implementation through sustainable fisheries co-management, biodiversity conservation and restoration of degraded landscapes in selected key biodiversity of Lake Tanganyika.	UNEP
Food Systems, Land Use, and Restoration Impact Program	To promote and strengthen food systems and land use through efficient food value and supply chains at scale.	Multi-donor (World Bank, UNDP, World Wildlife Fund, International Fund for Agricultural Development, European Union)
Food-IAP: Support for Sustainable Food	Project to support sustainable food production and climate resilience in the Highlands. GEF-	FAO

TABLE 6. CONSERVATION INITIATIVES BY DONORS IN BURUNDI

PROGRAMME /PROJECT	OBJECTIVE(S) AND IMPLEMENTING INSTITUTION	IMPLEMENTING AGENCY/DONOR PARTNER
Production and Enhancement of Food Security and Climate Resilience in Burundi's Highlands	funded and implemented by FAO, the IAP-FS project works with the Ministry of Environment, Agriculture, and Livestock to adopt improved production systems.	
Landscape restoration for increased resilience in urban and peri-urban areas of Bujumbura in Burundi	Project to strengthen integrated watershed management and flood management of the Ntakangwa river to ensure the resilience of upstream highland communities and downstream lowland communities living in/around Bujumbura.	UNDP/GEF

Source: (Global Environment Facility 2022)

5 THREATS TO TROPICAL FORESTS AND BIODIVERSITY IN BURUNDI

Per the Best Practices Guide, a threat is “a human action or unsustainable use that immediately degrades biodiversity (Kushnir and Martino 2020).” Table 7 below provides an analysis of the most pressing threats to Burundi’s biodiversity in descending order of importance. The Analysis Team sequenced the threats listed below based upon the intensity of the threat, its geographic breadth, and ultimately its imminent impact to biodiversity, as informed by concerns communicated by stakeholders and desk-based research.

5.1 DIRECT THREATS TO BIODIVERSITY IN BURUNDI

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
Encroachment in Protected Areas and Human-Wildlife Conflict	Burundi’s population has been growing at a rate of 3% annually, making it the fourth fastest growing country in the world (See 5.2.1 Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods) (Population Media Center 2022). Human encroachment into forests and protected areas constitutes one of the main threats to Burundi’s remaining biodiversity. Small-scale land conversion for agriculture and expanded settlements is widespread. Interviewed stakeholders working in or near protected areas agree that encroachment has been steadily increasing. Population growth and the dwindling availability of unoccupied land, coupled with displacement due to climate-change-related natural disasters (e.g., flooding) and the search for more fertile soil have resulted in encroachment into Burundi’s remaining natural areas, including protected areas. Poor demarcation of protected area boundaries also contributes to the prevalence of encroachment. In the absence of a clear park boundary and limited resources for patrolling, community members have little disincentive to cross into protected areas.

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>In addition, in recent years the government has struggled to manage the massive influx of returnees, displaced by the conflicts of the 1960s through the early 2000s (Ahitungye and Nemecek 2015). In seeking a new home, national and local authorities have tended to re-integrate migrant populations on state lands, often around protected areas (UNHCR 2021). This type of overpopulation, coupled with heavy reliance on agricultural livelihoods, contributes to the increased pressure on protected areas throughout the country (USFS International Programs 2010). Data taken from Kibira National Park in 2001 and 2009, for example, demonstrated high levels of forest loss. Most of which was attributed to encroachment, (Pfeifer et al. 2012).</p> <p>Encroachment by commercial agriculture is a growing threat to Burundi's biodiversity. A recent example is the near disappearance of the Malagarazi Ramsar Wetland Reserve due the encroachment of sugar cane (Nzigiyimpa et al. 2022). In addition to sugar, tea and palm oil plantations have increased in number and size over the past decade. Tea is Burundi's second largest export after coffee and employed over 300,000 smallholder farmers in 2016 (Nduwimana 2016). Tea is monoculture that is not typically planted within a diverse agricultural landscape, and as such is not highly compatible with biodiversity. Furthermore, tea requires curing, which necessitates firewood often taken from nearby forests. Proximity to the equator provides Burundi and neighboring countries with good climates for year-round tea cultivation (Nduwimana 2016). Recently, Office du Thé du Burundi was granted additional concessions to expand the Rwegura tea plantation into part of Kibera National Park. Palm oil expansion is equally threatening and predominantly cultivated in the communes of Rumonge and Nyanza-Lac (Ricardo 2013). Palm oil production is not only a contributing polluter to Lake Tanganyika (see Aquatic Pollution below), but also not a suitable value chain for agroforestry, and therefore provides little in the way of value to biodiversity conservation (IUCN 2018).</p> <p>As the population continues to increase with further agricultural development and reintegration by returned refugees, the fight for both land and resources is not only shared between people. Wildlife and biodiversity in and around newly settled lands and protected areas will continue to be affected by human encroachment. Communities like the Batwa that traditionally lived within forests and now often live outside protected areas are particularly vulnerable to human-wildlife conflict. In consultations, stakeholders living along protected area boundaries noted that, while their wildlife interactions have been limited, animals have eaten or destroyed crops. The species most often cited for crop destruction include baboons, grivets, and on rare occasion, chimpanzees (Bururi Province Women's Group 2022; Chief Warden Bururi 2022).</p>
<p>Poorly Regulated Infrastructure Development</p>	<p>Infrastructure development in protected areas in Burundi has an outsized impact on Burundi's remaining biodiversity given the limited remaining natural forests (FAO 2020; INECN 2014). Given the limited remaining unoccupied land, infrastructure development in protected areas is a pervasive problem in Burundi that results in forest loss and fragmentation of habitat. The reserve of Vyanda, for example, is threatened by the installation of approximately 300 households estimated at more than 300 and the construction of infrastructure such as the hospital of Kigutu, churches, and schools (Fofu et al. 2022; World Bank 2018). There is an EIA process for Burundi that should support</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	legislative mandates that preclude development in national parks and many protected areas. However, EIAs for donor-supported projects rarely elicit a substantive review and approval process by the Directorate of Environment and other relevant institutions and stakeholders (World Bank 2017). Protected areas such as Kirundi, are bisected by large hydropower infrastructure. Given the Government of Burundi prioritizes economic growth over biodiversity protection, the few remaining protected areas remain extremely vulnerable to future exploitation.

Timber Harvest for Charcoal, Firewood, and Construction

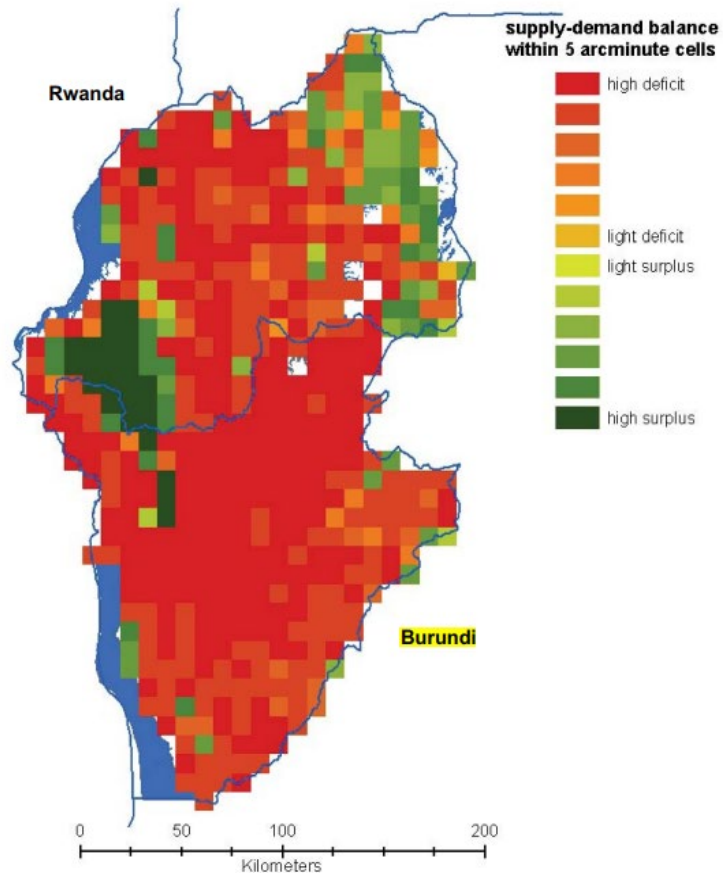


Figure 7: Supply-demand Balance for Firewood in Burundi

Timber harvest for charcoal, firewood and construction is a leading cause of deforestation in the country. Between 1990 and 2010, Burundi lost an average of 58.5 km² or 2.02% of forest per year. In total, between 1990 and 2010, Burundi lost 40.5%, or 1,170 km², of its forest cover (Butler 2011). Burundi's remaining forest ecosystems are contained almost entirely within protected areas. In 2018, Burundi launched a national reforestation program to combat pervasive deforestation (Butler 2020). Between 2010 and 2020 Burundi gained 860 km² of naturally regenerated forest (FAO 2020). Despite ongoing tree planting and reforestation projects such as the national reforestation program, primary forest cover in 2020 was at most 6.5% of Burundi's

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>total land area (R. A. Butler 2020).</p> <p>Burundians are highly dependent on charcoal and firewood, with approximately 90% of the population dependent on these sources of energy for cooking and heating (World Bank 2017). A recent study in Bujumbura found that 83% of households exclusively use charcoal for cooking. An additional 5% used some combination of charcoal and fuelwood. Results indicate that, for cooking only, an average of 0.78 kgs of charcoal per household are used per day (Sabuhungu, Ndimanya, and Lebailly 2015). In Burundi overall, about 96% of energy requirements are met through traditional biomass of which 70% is fuelwood, 18% agriculture residues, and 6% charcoal (WFP 2016). An average Burundian consumes 1.22 m³ of fuel wood and 0.04 m³ of wood for construction/furniture per year, meaning firewood is becoming increasingly scarce. The heavy dependency suggests that the yearly increase in forest coverage through reforestation efforts may not be able to keep pace with the yearly population growth (World Bank 2017). A 2010 study indicated that Burundi has one of the greatest firewood-resource deficits in the world (see figure 6). Furthermore, the efficiency of cooking methods in Burundi is very low, with 85-90% of the energy lost to the atmosphere (WFP 2016), (Drigo 2005).</p>
Bush Fires	<p>According to FAO, up to 90% of wildland fires in Sub-Saharan Africa are the result of human activities such as the uncontrolled use of fire to clear agricultural land, maintain grassland for livestock, extract non-wood forest products, and flush game for hunting (Held 2006). Bush fires are common in Burundi and are often caused by deliberate or accidental human actions. Farmers with limited machinery or resources to prepare land may set fires, which often spread beyond the area of intended burn. Bush fires are a common practice to improve agricultural yields, which cause significant damage across the landscape, accelerating the loss of biodiversity. Farmers cut and set fire to vegetation to clear the land to plant crops, which is considered a cheap and easy way of clearing lands while also killing pests and diseases. However, this technique can lead to deforestation, soil erosion and loss of biodiversity (Kayijamahe and Otieno 2020). Decreasing rains particularly in the northeastern region of the country due to climate change are increasing the likelihood of uncontrolled bushfires (World Bank 2018).</p> <p>Other common human actions tied to bush fires are for hunting, charcoal production, arson, and smoking out bees during honey harvesting. Fires are also tied to cooking, throwing away lit cigarettes, removal of invasive species, and waste dumping. According to the fifth national report on biodiversity, overgrazing and repeated bush fires have converted the Rusizi plain from groves of <i>Hyphaene</i> forest to open grasslands. Elsewhere in Burundi, persistent bush fires, coupled with timber harvest for charcoal, firewood, and construction (discussed above), have also led to habitat conversion from forested land to savannah. In the Kumoso depression, repeated burning in the bamboo forest has nearly removed the species entirely from the area (INECN 2014). In 2013, a forest fire in Vyanda's Nature Reserve consumed about 60% of the total area of the reserve (Business Standard News 2013).</p> <p>Several consultations with stakeholder near and in Bururi Forest, Ruvubu National Park and Kibria National Park, undertaken to inform this assessment, noted the success of creating fire breaks, increased training of OBPE patrol staff and community</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>volunteers, and other fire control methods have effectively begun to reduce the damage from fire near these areas. Anecdotally, it appears that this threat has decreased in severity in these locations in recent years given additional attention and resources by protected areas management authorities.</p>
<p>Illegal, Unsustainable, and Poorly Regulated Fishing</p>	<p>Illegal and unsustainable fishing practices have increased pressure on Burundi's fisheries (USFS International Programs 2010). Population growth in the surrounding area has resulted in an uptick in the number of fishermen, quadrupling the rate of overfishing in Lake Tanganyika and the northern lakes (Global Nature Fund 2017). Fish stocks in Lake Tanganyika have declined by 25 percent and certain native species have disappeared (USFS International Programs 2010). Species endemic to Lake Tanganyika including lates, inzinga, inyika have been drastically reduced, and ikinanga have almost completely disappeared from Burundian waterways (Kanyange 2020). In addition to a decline in species diversity, local fishermen note the changes in catch composition and quantity (USFS International Programs 2010).</p> <p>Unregulated practices, such as fishing with mosquito bed nets, have increased in recent years. The Lake Tanganyika Floating Health Clinic found that 87% of the 196 surveyed residents had used mosquito bed nets for fishing (McLean et al. 2014). Mosquito bed nets catch large swaths of fish of different sizes and species, which can lead to excessive and uncontrolled extraction (USFS International Programs 2010). Fishing with destructive, non-selective gear, such as mosquito bed nets, has exacerbated the rate of decline in fisheries.</p> <p>At present, there are no controls or limits to the species or quantity of fish caught (USFS International Programs 2010). Fishing during spawning periods is widespread and uncontrolled, limiting the capacity of fish stocks to regenerate and recover. Updated inventories of the fishery sector on aquatic species are needed to guide fisheries management.</p>
<p>Climate Change</p>	<p>Climate change is both a direct threat and driver of biodiversity loss in Burundi. For example, increased water temperatures have decreased fish populations, water quality, and nutrient cycling in lakes such as Tanganyika and Victoria (USAID 2020a; Ministry of Environment, Agriculture, and Livestock 2019). In addition, an estimated 107 mammal, 199 bird, 31 fish, 34 amphibian, and 79 plant species in the Albertine Rift are highly vulnerable to climate change, which may affect species' heat sensitivity and habitat suitability. Increased temperatures and flooding can increase physiological stress, shift distributions of native and invasive species, disrupt interspecies relationships, increase wildfire risk, and damage ecosystems (USAID 2020).</p> <p>Among climate hazards, Burundi's biodiversity is particularly vulnerable to increasing drought, and the country has already experienced a decline in total precipitation, and longer dry seasons. Climate-induced drought have impacted agricultural viability of standard crops and made forested areas more prone to bush fires, which have replaced forest ecosystems with savannah or desert plants, reducing biodiversity (Republic of Burundi 2019). Increased dryness also increases water stress in marshes, accelerates desertification, and results in emergence of new plant pests, all of which could further affect ecosystems and reduce biodiversity (Republique du Burundi 2007).</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>In addition, warming waters within Lake Tanganyika and others reduce fish populations. A 2016 study by the University of Arizona concludes that “Warming has intensified the stratification of the water column, thereby trapping nutrients in deep water where they cannot fuel primary production and food webs” (Kanyange 2020).</p> <p>Burundi is highly vulnerable to climate-related disaster events, including increased flooding and precipitation-induced erosion and landslides (Ministry of Foreign Affairs of the Netherlands 2018). Since September 2015, more than 4 million people have been affected by heavy or torrential rains, water deficits, high winds, floods, and landslides. These destroyed 300 km² of crops and 5,000 homes (Ministry of Environment, Agriculture, and Livestock 2019). Climate-related disaster events have triggered forced displacements of people within the country in recent years, adding to the fragility of rural lives and livelihoods - many of which are dependent on natural resources including forests and agricultural systems (Voegele, Kabongo, and Tall 2021a). This close link between climate fragility and resource dependence means that climate change is changing patterns of land use as agricultural patterns shift and land is degraded. Beyond displacement, flooding events could cause direct damage to forest ecosystems through washout and triggering landslide events. Flooding may also increase runoff and reduce infiltration, which can deplete aquifers and drain wetlands, removing water sources for flora and fauna and having irreversible losses on biodiversity (Ministry of Environment, Agriculture, and Livestock 2019).</p>
<p>Poaching, Subsistence Hunting, and Illegal Wildlife Trade</p>	<p>Poaching and hunting in Burundi are motivated by several factors, chief among them are subsistence hunting, crop protection, and the illegal wildlife trade. The highest concentrations of remaining wild animals in Burundi are in and near protected areas. Stakeholders identified both Kibira and Ruvubu National Parks as common locations for hunting. In Ruvubu National Park, stakeholders noted common species subject to hunting include water buffalo, small antelope, baboons, grivet monkeys, geese, and other bird species. Reasons frequently cited for hunting include lack of other readily available forms of protein and as a preventative and/or retaliatory measure by farmers to keep animals away from their crops. Anecdotally, stakeholders noted that bushmeat hunting for primates was not a culturally accepted practice, however, displaced Burundians returning from the Democratic Republic of the Congo have in some cases brought back with them a different culture of bushmeat consumption. Displaced communities may rely on hunting due to food insecurity, which is often exacerbated by resettlement concentrating displaced people in areas with inadequate access to alternative sources of protein (Reliefweb 2008).</p> <p>Hunters, motivated by obtaining animal skins and horns, have been another cause of overexploitation of animals in Burundi (INECN 2014). Currently, Burundi records more than 10 species of animals that have disappeared as a result of hunting and habitat destruction since the end of the 19th century, these species include cheetah, lion, plains zebra, black rhinoceros, common eland, impala, Lichtenstein’s hartebeest, common tsessebe, African savanna elephant and eastern gorillas (INECN 2014). The World Wildlife Fund cites widespread declines in hippopotamus populations due to ivory poaching. The canine teeth of an adult male hippopotamus can fetch about \$1,000 (Niyoyita 2003).</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>The hunting of reptiles for consumption is mainly practiced in the Imbo region and in the Rusizi plain where populations of Nile monitor, Nile crocodile, African rock python, and the West African mud turtle are threatened. It is consumption and marketing that have contributed greatly to this rise in exploitation of crocodiles, the two species most affected being the Nile crocodile and West African slender-snouted crocodile. The latter was already rare and is only found in the Rusizi plain. Reportedly, most Nile crocodiles in Lake Tanganyika were eaten during the Burundian civil war, leaving only a few individuals (McNeish 2014). Other reptiles that suffer from poaching are the snakes. The most sought after are the African rock python, puff adder and Gabon viper which are edible and whose skins are used in traditional medicine and also exported (INECN 2014).</p> <p>The species most exploited for illegal trade include several species of snakes, fish, turtles, birds and amphibians. Snake species commonly caught for trading are the West and Central African viper, Gabon viper, black-necked spitting cobra, and black cobra. Vulnerable species of fish caught and sold include the Julie cichlid, goby, blue cichlid, and catfish (INECN 2014). The most highly traded of Avian Fauna includes the East African crane, red-necked spurfowl, and the helmeted guineafowl, parrots and lovebirds are also threatened by hunting, especially the Meyers parrot, the red-faced lovebird and Fischer's lovebird (INECN 2014).</p>
<p>Poor Agricultural Practices</p>	<p>Poor agricultural practices are a significant threat to Burundi's forests and biodiversity. Employing approximately 90% of the population, agriculture accounts for approximately 40% of Burundi's annual GDP (CIA 2022; UNICEF 2021). Small-holder farms, limited animal husbandry, and commercial farm enterprises make up the majority of agricultural production. Of Burundi's 25,680km² total land area, a purported 23,370 km², or 91%, is classified as agricultural land (USAID 2010). Encroachment into protected areas, soil erosion, pollution from overuse of agrichemicals, increased incidents of human-wildlife conflict, and habitat destruction from fires are several of the negative consequences for forests and biodiversity associated with agricultural production. These anthropogenic threats are compounded by climate change – further discussed both as a direct threat above, and as a driver of threats in section 5.2.</p> <p>Consultations and case studies support that population growth has had negative consequences for the productivity of agricultural land and driven encroachment into protected areas. From 1979 to 2009 land holding per household decreased from 0.007 km² to 0.005 km² (Ntakirutimana and Vansarochana 2020). As Burundi's population continues to grow, and without a shift away from reliance on agriculture, a shortage of available fertile land will lead to even greater pressure on Burundi's remaining forests and protected areas.</p> <p>Annually, Burundi loses 38 million tons of soil to land degradation due to poor agricultural practices (Voegele, Kabongo, and Tall 2021a). Common poor agricultural practices include lack of contour planting, which increases the erosion potential of farms. Loss of topsoil results in dependence on fertilizers to maintain agricultural productivity which increases pollution and biodiversity loss from improper use of agrochemical inputs. As an example, soil degradation has reduced coffee production in</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	<p>Burundi by two-thirds over the past 40 years (Voegelé, Kabongo, and Tall 2021a). Poor agricultural practices also increase farmers' susceptibility to shocks (e.g., natural disasters and crop failure), and heighten the likelihood of farmer displacement and associated biodiversity loss from resettlement. As climate change continues to present more severe inclement weather patterns, Burundian farmers are more vulnerable to crop failure, increasing the likelihood for food insecurity, and furthering farmers dependence on increasingly unproductive land.</p>
<p>Aquatic Pollution and Poor Solid Waste Management</p>	<p>Bujumbura lies along the shore of Lake Tanganyika and is the largest source of the aquatic pollution into the lake and its surrounding tributaries. Agro-industrial factories such as tea, coffee, and palm oil extraction, are major sources of water pollution, as most are along the lake shores. As an example, in Rumonge, 94% of all palm oil artisan factories are along the shores of rivers due to their water supply and effluent disposal needs, resulting in high levels of pollutants. Expansion of agricultural and industrial practices from villages along the Lake Tanganyika basin are also increasing sedimentation and pollution into the lake. Tributary rivers and streams feeding Lake Tanganyika deposit untreated waste from the economic capital Bujumbura, further damaging fish habitats (Kanyange 2020).</p> <p>Lack of sanitation infrastructure for household, municipal, and industrial sewage result in solid waste entering Lake Tanganyika untreated. Access to adequate sanitation has been disrupted for years due to the civil war. In 2017 only 13% of rural areas and 33% of urban areas had access to adequate sanitation systems (World Bank 2017). Fishing boat landing stages also contribute to this aquatic pollution, as only 14% of the landing sites have publicly available restrooms (Kanyange 2020).</p> <p>Other sources of pollution include runoff of heavy metals, oil, and other vehicle waste from garages and parking lots. Studies on water source pollution at sites around Bujumbura show high concentrations of nitrates from fertilizer runoff, sulfides and fluorides, and heavy metals such as bromates and chromium from garages and industrial centers (World Bank 2017). In addition to the lack of waste infrastructure, there is a lack of adequate government oversight and capacity to reduce these sources of water pollution.</p>
<p>Invasive Species</p>	<p>Invasive species (intentionally or unintentionally introduced plants and wildlife) were identified by stakeholders as a pressing threat facing biodiversity. Invasive plant species, particularly aquatic plants, are problematic in Burundi and can replace or destroy native habitat or native plant species.</p> <p>Water hyacinth, Nile cabbage, and lantanas, are key invasive species threatening biodiversity in Burundi. Water hyacinth is invasive in Lake Tanganyika, northern lakes including Rweru and Cohoha, and increasingly seen in rivers. Hyacinth reduces oxygen levels, impeding productivity of the aquatic ecosystems. Nile cabbage forms a covering mat on water surfaces, similarly to hyacinth, reducing oxygen levels required for nocturnal respiration of aquatic ecosystems.</p> <p>Lantana outcompetes other species in secondary forests and agricultural areas, reducing crop productivity and local biodiversity (World Bank 2017). It is also toxic to livestock and has been found to supplant several native plant formations found in Ruisi</p>

TABLE 7. PRIORITIZATION OF DIRECT THREATS TO BURUNDI'S BIODIVERSITY

THREAT	DESCRIPTION
	national Park (World Bank 2017).
Mining	<p>While the mining sector in Burundi (both artisanal and commercial) is relatively small in comparison to neighboring countries, it is poorly regulated, and often conducted illegally. Furthermore, Burundi is actively trying to increase its share of mineral wealth from mining. If it succeeds, mining may become more prevalent. Burundi contains gold, nickel, copper, cobalt, and various ores (Kanyange 2022). Most mining in Burundi occurs in the northern provinces of Kayanza, Cibitoke, Kirundo, and Muyinga (Nyatanyi 2022). Mining degrades soils and riverbanks, across all ecosystem types in Burundi. These activities result in polluted runoff of hazardous chemicals leaching into the groundwater and extensive vegetation destruction through clearing of land. For example, environmental degradation is found in Rusizi National Park from sand and gravel mining for construction, Kibira National Park from gold mining, and Murehe Reserve from coltan and cassiterite extraction (World Bank 2017). Mineral washing by its nature must be conducted near water sources, directly bringing heavy metals downstream from the mining itself.</p> <p>In 2021, Burundi suspended several international mining contracts over disputes that the country is not receiving a fair benefit (currently 10% of income) (Kanyange 2022). However, there is significant potential for the mining sector to expand, as the country holds the second largest reserves of nickel globally, and large reserves of other minerals such as phosphates and limestone. There is a lack of effective management over these resources and transparency in the sector. Intensifying mining may also lead to increased local conflicts over resources (World Bank 2017).</p>

5.2 DRIVERS OF THREATS

Per the Best Practices Guide, a driver is a “constraint, opportunity or other important variable that positively or negatively influences direct threats.” There are many factors driving the threats identified above, but the most significant and influential drives in Burundi are as follows:

- Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods
- Lack of Energy Alternatives
- Legacy of Conflict and Land Tenure Challenges
- Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity
- Lack of Environmental Data and Monitoring
- Legislative Gaps
- Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors
- Climate Change

Each of these drivers are interrelated and affect numerous threats.

5.2.1 POVERTY, DEMOGRAPHIC PRESSURES, AND NATURAL RESOURCE DEPENDENT LIVELIHOODS

One of the least developed countries in the world, Burundi is ranked 185 out of 189 on the Human Development Index. It is estimated that 65% of the population lives below the poverty level and 73% of the population is classified as poor (USAID 2022; UNICEF 2021). High population growth (averaging 3.3% annually over the past two decades) and density, large numbers of refugees, and lack of livelihood alternatives, all contribute to poverty, driving biodiversity loss in the country (World Bank 2017).

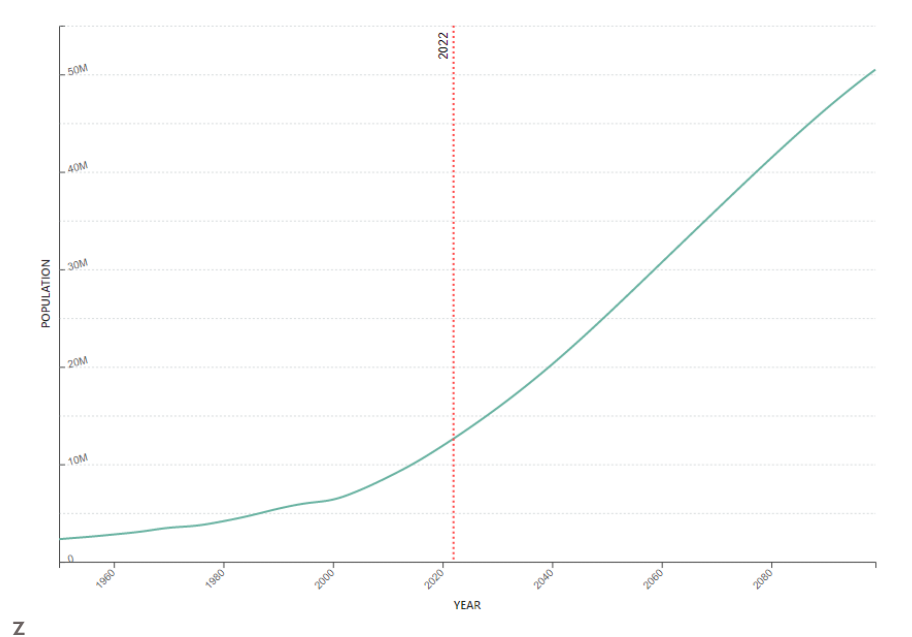


Figure 8. Expected Population Change in Burundi

Exacerbated by the political crisis of 2015, and now devastating effects from the COVID-19 pandemic, Burundi's real GDP growth was -3.3% in 2020. While GDP is projected to grow 2.1% for 2022, this weak increase is largely driven by depleting the country's natural resources and is not expected to meet the social and environmental demand of a growing population that remains reliant on natural-resource-intensive livelihoods, with significant impacts on biodiversity (World Bank 2017). See figure 8 for current and projected population change (World Population Review 2022).

Burundi is expected to double its population by 2050, due to one of the highest fertility rates in the world (5.5 children per woman) (World Bank 2022). Returning refugees are also adding a population stressor for natural resources. Rapid population growth in such a small country has created extreme population density, comparable to India (World Bank 2017). To feed and house this growing population, forests are cleared for agriculture, a sector on which most of the population relies for income generation.

Nearly 90% of this growing population lives in rural areas with the same percent employed in subsistence agriculture ("Burundi" 2022). The lack of livelihood alternatives to agriculture places unsustainable strain on natural capital, further driving environmental degradation, and biodiversity loss.

5.2.2 LACK OF ENERGY ALTERNATIVES

Burundi is one of the least electrified countries in the world, with around 11% of the population having access and only 2% in rural areas (IRENA 2018b). The electrification rate in Burundi is two-thirds lower than the rest of sub-Saharan Africa (16%) (AfDB 2021). Burundi's extreme energy poverty is explained, in part, by the civil conflicts that have plagued the country and halted investment in energy and associated infrastructure. In addition to energy poverty, Burundi faces energy inequity, with a significant divide between urban and rural areas. As of 2015, Bujumbura consumed 95% of all electricity generated, leaving the rural population to rely on solid fuels (Berndtsson 2015).

Fuelwood (firewood and charcoal) is the main source of energy in Burundi for approximately 98% of the population, leading to one of the highest annual deforestation rates in the world, over 2% (SCBD 2009), and a 7% loss of tree cover over the past 8 years (Global Forest Watch 2022). The reliance on fuelwood for energy from a rapidly growing population has continued to reduce the limited forested land in the country and has led to high soil degradation. A lack of effectively managed sustainable firewood supply is a key challenge to protecting forests. While fuel-efficient cookstoves have been introduced, stakeholders consulted note that the stoves have had limited success due to the expense of these stoves, lack of adoption, and improper use.

While there is a potential for solar power and expansion of hydropower in the country, these sources remain under-used, and there has been virtually no change in the energy mix over the past decade (petroleum products at 2.5%, hydroelectricity at 0.6% and peat at 0.05%) (Nigarura 2021). As the population continues to grow, the urgency for expanding the energy mix away from fuelwood will grow.

5.2.3 LAND TENURE CHALLENGES & LEGACY OF CONFLICT

Conflict-driven displacement, along with climate change and loss of economic activity alternatives, has added stress to already ecologically fragile hills and higher-altitude forests and increased competition for basic natural resources (World Bank 2017). The lack of clear, formal land-tenure and registry systems, political instability, and population growth, exacerbated by returning refugees, amplify local-level conflicts over land, water, and natural resources.

Burundi has faced extended periods of cyclical sociopolitical conflict, with direct linkages to poverty and environmental degradation. Ethnically driven conflict dates to the 1960s struggle for independence, followed by the 1972 Hutu revolt and subsequent massacre led by the Tutsi government. Civil war, resulting from the 1993 presidential election, killed hundreds of thousands and displaced 1.2 million. Violence in the 2015 presidential election led to thousands killed and further displacement.

Extended civil conflict has led to land grabbing, particularly in areas critical for biodiversity (parks and forest reserves), which were not already being used for agriculture (USFS International Programs 2010). Burundian refugees returning from Rwanda, Democratic Republic of The Congo, Uganda, and Tanzania, as well as Congolese refugees, are facing increasing conflict over land. According to OBPE reports, between 2000 and 2010, most returnees settled in the protected areas, particularly in the protected areas of southern Burundi, such as the Vyanda and Kigwena nature reserves as well as in the protected landscapes of Makamba (OBPE 2020). It is estimated that 80% of Burundians displaced by conflict were landless in 2010 (USAID 2010). In 2020 alone, despite COVID-19 restrictions on movement, 41,000 refugees returned to Burundi (UNDP and UNHCR 2021).

Land tenure insecurity contributes to the ongoing exploitation of natural resources for livelihoods and increases local conflicts. The lack of effective land management and planning systems, combined with high population growth, returning refugees, ever-receding available arable land, with climate change further reducing availability of quality land, create land tenure challenges that are drivers of threats in Burundi.

The nation-wide ineffective land management and planning systems contribute to land tenure challenges. There is no digitization of land tenure documents, making them difficult to track. These land ownership documents are also not kept in any centralized repository, rather only at the sub-national level. As such, the government struggles to manage procedures for the transfer and concession of State land, as highlighted in the Decree N°100/72 of April 26, 2010 adopting the Land Policy Letter in Burundi (Kohlhagen 2012).

It is estimated that two-thirds of all court cases are related to land tenure conflicts, and 60% of all crimes are connected to land (USFS International Programs 2010). Land disputes brought before the formal court system often are lengthy and there is lack of training and resources in the courts (USAID 2010). As resources become more scarce and land becomes more limited, these local-level conflicts are expected to worsen (UNDP and UNHCR 2021).

The cultural practice of dividing land as inheritance creates ever-decreasing area plots, further contributing to land fragmentation and limiting forest expansion. (Average per capita farm size is under one hectare, or .01 km²) (USFS International Programs 2010). Traditional land tenure systems and customary law often are undocumented and unclear, and they make it difficult for women to own land, as they are excluded from family succession of land inheritance (Tchatchoua-Djomo and van Dijk 2022).

5.2.4 STRUCTURAL CONSTRAINTS: LACK OF INSTITUTIONAL CAPACITY AND HUMAN RESOURCES FOR BIODIVERSITY

While the country is found to have fairly robust environmental policies, there are major gaps between policy, implementation, and functionality to protect both the environment and people (World Bank 2017). Mandated to administer and regulate environmental management and protection, The Ministry of Environment, Agriculture, and Livestock, finds itself facing two main institutional challenges, namely (1) lack of financial resources and (2) lack of qualified human resources (World Bank 2017). These two challenges greatly impede the government's ability to enforce environmental laws and further inhibit its ability to create and implement sustainable environmental natural resource management programs (World Bank 2017). Even more, these two institutional constraints double both as a threat and driver towards agricultural expansion within the country, as they not only inhibit the agricultural sector of the ministry but the environment as well.

An additional consequence stemming from Burundi's lack of financial and human resources capabilities is its inability to carry out and fulfill policy implementation. Stakeholders noted a concern that "laws are good, but they lack follow-up." Weakness in finance can best be exemplified through Burundi's low 1.6% budget of government expenditure on environmental activities. As explained in The World Bank's Environmental Country Analysis, this expenditure is too low to curb any environmental degradation in Burundi (World Bank 2017).

5.2.5 LACK OF ENVIRONMENTAL DATA AND MONITORING

Lack of capacity has resulted in, among other gaps, little to no monitoring data since the 1980s/1990s. The last national inventory of forests, for example, was undertaken in 1992. There is no current national data available on the status of, or trends related to, Burundi's forest resources (USFS International Programs 2010). Conversations with stakeholders and extensive research to inform this analysis revealed significant gaps in the biodiversity, natural resource, and ecosystem services data available. Sources indicate that information on a variety of biodiversity related issues are either outdated or unavailable. Despite these difficulties, there remains a clear and strong relationship between natural resource management and development, even more evident within developing countries (Ndzabandzaba 2015). This is best exemplified in Burundi's 2015 Environmental Country Analysis, where it was apparent that declining forest quality was one of the main threats to Burundi's biodiversity, yet even with this information, the data collected was limited in scope and the extent of forest degradation could not be properly observed (World Bank 2017). The limitations and gaps that exist are detrimental to acknowledging and understanding the origins of environmental threats to best be able to address them in the long run. Take, for example, the Aichi Biodiversity Target II Country Dossier. In this report, data was collected by UNDP and Secretariat for the Convention on Biological Diversity to assess protected areas and to measure terrestrial and marine life of the country. Despite their analysis, they determined that, while they can provide useful information, they cannot replace analysis at a national level, which can truly aid national policy and decision-making on the ground (SCBD 2021). Research into Burundi's capacity to address environmental problems demonstrated that the lack of good quality environmental and climate data was a major problem, given that Burundi is particularly susceptible to severe climate impacts. Burundi is at high risk of rainfall shortages and soil erosion, both in the north and northeast. Both risks then contribute to food security within the country (Ministry of Foreign Affairs of the Netherlands 2018). Without more data on extreme weather patterns, disaster relief or management plans for resilience cannot be properly formed.

A more nuanced example of the need for more data is related to implementation of Burundi's 2015 Nationally Determined Contribution (UNEP 2015). The report's authors indicate that Burundi must strengthen its disaster risk management framework, but the authors identify insufficient climate data as a key gap in improved plan development (UNEP 2015). The first step to building a stronger disaster risk management plan is more data collection, only elongating and slowing progress of disaster risk management activities, such as establishment of early warning systems for flooding and other shock events. In addition, there are gaps in data sharing and observation (Ndzabandzaba 2015). Throughout developed and less-developed countries, networks for data sharing fail to provide sufficient data, resulting in observational gaps as well as data scarcity (Ndzabandzaba 2015).

5.2.6 INSTITUTIONAL WEAKNESSES

Reflected in Section 4 above, Burundi has both robust domestic legislation and is a part of major international environmental treaties, conventions, and agreements (World Bank 2017). However, weak institutional capacity greatly impedes legislation's ability to enact real change. Information reported from Burundian consultants confirm that almost all the forest, biodiversity codes, laws lack implementing texts, and even the texts that do exist are not sufficiently known by the population.

As of 2015, there was no specific body in charge of coordinating, planning and implementing environmental programs, projects, and activities (World Bank 2017). In October of 2014, OBPE took

over for the INECN. Under OBPE's mandate falls responsibilities pertaining to the enforcement of all environmental protection related legislation and monitoring and evaluation of development programs. However, the actual implementation of programs lacks an institutional body, as the OBPE was equipped for the planning and operational role rather than implementational (Development Bank of Southern Africa 2021).

In addition to the lack of a coordinating body, Burundi also has an uneven implementation of laws and regulations meaning it does not have a formal public comment process and there are no informal regulatory processes managed by non-governmental organizations or private sector associations (U.S. Department of State 2020). As will be addressed in the 5.2.10 "Weak Investment" section of this report, Burundi seeks to promote economic growth through more foreign direct investment, but inconsistent implementation of laws and regulations limits predictability for foreign investors, further disincentivizing potential investors and exacerbating programmatic implementation of conservation efforts (U.S. Department of State 2020).

Additionally, the judicial system is not effectively independent of the executive branch. A lack of capacity hinders judicial effectiveness, and judicial procedures are not rigorously observed (U.S. Department of State 2020).

5.2.7 WEAK INVESTMENT AMONG GOVERNMENT, BILATERAL, MULTILATERAL, PRIVATE AND NGO ACTORS

After the political unrest of 2015-2018, Burundi investment from donors had dramatically reduced. Therefore, Burundi was dealing with a large account deficit, where the value of the goods and services it was importing exceeded the value of the products it exported (CIA 2022). However, data collected in the 2021 World Investment Report found that foreign direct investment into the country increased from one million USD in 2019 to six million USD in 2020 (Lloyds Bank 2022). This was despite the global economic situation resulting from the COVID-19 pandemic and in comparison to other African countries where foreign direct investment contracted (Lloyds Bank 2022). In fact, the East African region saw a 16% decline in foreign direct investment in 2020 (AFR-IX telecom 2021).

The 2020 Investment Climate Statement by the US Department of State stated that the GOB sought to attract more foreign investment, namely to "modernize and diversify agricultural production, build power plants, increase regional trade by strengthening the transport network and improve quality of human resources" (U.S. Department of State 2020). In seeking progress forward, Burundi currently possesses an investment code that grants various potential fiscal and custom benefits to investors and has recently adopted new laws on the free trade area known as the African Continental Free Trade Area (U.S. Department of State 2020). By becoming a part of the African Continental Free Trade Area trading bloc, Burundi hopes to stimulate intra-Africa trade (U.S. Department of State 2020).

Unfortunately, as mentioned, poor governance infrastructure, financial restrictions, and low-skilled workforce has limited foreign direct investment and potential opportunities for inter-African trading (U.S. Department of State 2020). According to Ministry of Finance, even before the political unrest of 2015, Burundi suffered from weak mobilization of internal resources (11.7% of GDP in 2015 compared with 12.9% in 2014 and 13.1% in 2013) and from a substantial fall in foreign aid (-33% in 2015) (Kwemo 2017). Consultations with in-country stakeholders concur, saying that while Burundian civil society is active in the protection of the environment and of forests in particular, Burundi lacks sufficient technical and financial capabilities to truly support efforts in effective conservation.

5.2.8 CLIMATE CHANGE

Burundi is the country with the lowest per-capita greenhouse gas emissions, ranking last out of 188 countries worldwide (Voegele, Kabongo, and Tall 2021b). Despite this, the country is already experiencing adverse impacts from anthropogenic climate change. Burundi's biodiversity, forests, and critical ecosystems are highly vulnerable to these climate change impacts, which are a driver exacerbating other resource management issues including deforestation, land degradation, and land use change, and lack of quality infrastructure.

Nationwide, the country has experienced the effects of climate hazards including severe drought and floods, changes to precipitation patterns, erosion, and landslides. In particular, the country is experiencing the impacts of changing temperatures and rainfall patterns: From 1930 to 2000, the average annual temperature increased by 0.8°C, and the country has experienced a decline in total precipitation and longer dry seasons while extreme rain events have been on the rise. Drought and erosion particularly affect Mabanda and surrounding areas and the north and eastern depressions and plateaus, while frequent excessive rains and flooding affect the western Imbo plains (Ministry of Foreign Affairs of the Netherlands 2018).

These climate hazards have already had adverse impacts on Burundi's ecosystems and exacerbated existing issues that threaten the country's biodiversity. Some areas, such as the Rusizi plain, trend toward desertification. Drought has reduced water resources in the mountainous Mirwa basins, central highlands, and Bugesera depressions. As such, these areas have been more susceptible to an increase in bush fires, which, combined with existing overgrazing and deforestation, has cleared forest ecosystems and replaced them with savannah plants or desert landscapes (Ministry of Environment, Agriculture, and Livestock 2019).

Climate change is projected to exacerbate these impacts to ecosystems and biodiversity into the future. Compared to 1995-2014, annual average temperature in Burundi may increase by 0.4°C per decade and up to 1.2 to 1.7°C by 2040-2059 under SSP2-4.5⁸ (World Bank 2020), with some areas (like the Imbo plain) projected to experience higher increases (WFP 2021) and some estimates of up to 1.9°C by 2050 (Ministry of Foreign Affairs of the Netherlands 2018). The East Africa region, which includes Burundi, may experience a 3-16% increase in precipitation by 2030 (USAID 2020), and by 2050, Burundi's rainfall patterns may change so that it has two six-month seasons: one rainy season (November to April) and one, longer, dry season (May to October) (Ministry of Foreign Affairs of the Netherlands 2018). Precipitation extremes are also expected to increase; Burundi could face reduced precipitation in the tail ends of the rainy season and more intense and frequent droughts occurring 40-60% of the time, particularly in the northern depressions and eastern plateaus. Burundi may also experience more days with heavy rain, more severe and frequent floods in low-lying areas such as the Imbo floodplain, and an up to 40% increase in flows in the Rusizi and Ruvubu rivers, posing flooding risks (Ministry of Foreign Affairs of the Netherlands 2018; WFP 2021). Flooding may increase especially in northern and eastern provinces, Imbo plains, lowlands, and Lake Tanganyika (Ministry of Foreign Affairs of the Netherlands

⁸ SSP2-4.5, or Shared Socioeconomic Pathway 2-4.5, is one of five possible future scenarios used by the UN Intergovernmental Panel on Climate Change. Each scenario includes calculations for future changes to greenhouse gas emissions and projected socioeconomic changes. SSP2-4.5 is a "middle of the road" scenario. CO₂ emissions remain about the same before starting to fall mid-century, but do not reach net-zero by 2100. Socioeconomic factors follow their historic trends, with no notable shifts. Progress toward sustainability is slow, with development and income growing unevenly. In this scenario, temperatures rise 2.7°C by the end of the century.

2018; Ministry of Environment, Agriculture, and Livestock 2019). Erosion and landslides may increase in the southern zone, central plateau, and mountainous Mirwa watershed, causing damage to forests (Ministry of Foreign Affairs of the Netherlands 2018; Ministry of Environment, Agriculture, and Livestock 2019).

Future climate impacts, including increased dryness and drought, could result in draining of marshes, aridity, soil degradation, increased desertification (including in the Rusizi and Bugesera areas), and emergence of new plant pests – thus contributing as a driver of biodiversity loss (Ministry for Land Management, Tourism, and the Environment 2007). In addition, the Cohoha, Rweru, Rwihinda, and Kanzigiri lakes in the Bugesera depression may experience dropped lake levels, leading to biodiversity loss in the pelagic zone and decreases in fish production, while increased temperatures may worsen eutrophication in lakes, decreasing species that rely on oxygenated water (Ministry of Environment, Agriculture, and Livestock 2019).

Climate change impacts could also exacerbate existing challenges with deforestation, agriculture viability, and food insecurity. As farmers combat food insecurity by expanding agriculture onto steep slopes and wetlands, flooding could worsen soil erosion in mountainous areas (Ministry of Foreign Affairs of the Netherlands 2018; USAID 2020a). Agricultural expansion and deforestation are also resulting in loss of wetlands and nature reserves, like Kibira and Ruvubu National Parks. Deforestation may increase runoff and reduce infiltration, depleting aquifers, and drained wetlands could have irreversible losses on biodiversity (Ministry of Environment, Agriculture, and Livestock 2019). Overgrazing in marshes also compacts soil and destroys vegetation, resulting in hydrological imbalances, increased flood frequency, and reduced biodiversity. For example, Rwihinda Lake attracts a diversity of migratory bird species that may be threatened from the combined effects of encroaching agriculture and climate change (Ministry of Environment, Agriculture, and Livestock 2019).

6 ACTIONS NECESSARY TO CONSERVE AND PROTECT TROPICAL FORESTS AND BIODIVERSITY

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
TIER 1: HIGHEST PRIORITY		
ACTION 1: SUPPORT ONGOING EFFORTS AND GAINS IN DEMOCRATIC STABILIZATION TO ENSURE AN ENABLING ENVIRONMENT FOR BIODIVERSITY CONSERVATION.		
<ul style="list-style-type: none"> • Seek avenues for regional and international diplomatic engagement and strengthen effectiveness of government and civil society to manage natural resources. • Reengage in the coordination of government and donor-sector working groups to encourage investment in different development sectors (e.g., energy, NRM, disaster resilience, conservation). • Address underlying drivers of political unrest, provide continued support and funding for reconciliation initiatives, and support peaceful, free, and fair elections. • Encourage regional environmental cooperation with neighboring countries to promote peace building, enhance important environmental initiatives, support transboundary water and landscape management, and share information. • Support revitalization of civil society actors and non-government organizations, especially those focused on environmental conservation and biodiversity protection. • Improve capacity of media and journalists, including biodiversity messaging. 	<ul style="list-style-type: none"> • Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods • Legacy of Conflict • Land Tenure Challenges & Legacy of Conflict • Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity • Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors 	
ACTION 2: SUPPORT FOOD SECURITY, FAMILY PLANNING, AND ECONOMIC GROWTH INITIATIVES ALIGNED WITH BIODIVERSITY AND FOREST CONSERVATION GOALS.		
<ul style="list-style-type: none"> • Train extension service providers and direct technical assistance to communities on the use of agricultural best practices (including livestock and aquaculture). These include climate smart and climate-resilient practices such as: <ul style="list-style-type: none"> ○ agroforestry initiatives that can improve soil fertility while providing biomass energy alternatives; ○ intercropping and crop rotations; contour farming; post-harvest 	<ul style="list-style-type: none"> • Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods • Lack of Energy Alternatives 	<ul style="list-style-type: none"> • Encroachment in Protected Areas and Human-Wildlife Conflict • Timber Harvest for Charcoal, Firewood, and Construction

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<ul style="list-style-type: none"> ○ agricultural byproduct management; and ○ selection of agrochemicals, proper timing of their application, and use in appropriate quantities. ● Catalyze sustainable natural resource-based enterprises (e.g., eco-tourism) through 1) increased access to finance, 2) facilitated linkages to interested community partners, and 3) support of sustainable practices that increase benefits and/or revenue received by communities for conservation and effective natural resource management. ● Encourage Public-Private Partnerships with communities engaged in participatory natural resource management to enable piloting of new innovative enterprises (e.g., linkages between hotels, national parks, and nearby communities to support eco-tourism). ● Support community enterprises to purchase, utilize, and maintain regulation fishing gear. ● Implement simple irrigation systems (e.g., pumping equipment) in lakeside communities to improve agricultural yields and disincentivize lakeside agriculture (currently banned). Such efforts could be combined with the development of drinking water infrastructure. ● Nurture non-traditional sustainable value chains (e.g., mushroom farming, fruit tree farming, shade-grown coffee) to discourage unsustainable resource extraction and to reduce poor land management practices. Invest in and scale up other agricultural value chains that have positive implications for biodiversity. ● Invest in sustainable initiatives that place emphasis on the participation of women and vulnerable groups. The inclusion of women in natural resource management development projects has been shown to have particularly good outcomes. The inclusion of vulnerable groups (e.g., Batwa or other marginalized communities) is essential to relieve pressure on forest resources. ● Promote sustainable agroforestry by providing technical assistance, equipment, and inputs and coordinate efforts with education and behavior-change communications. ● Locate sustainable livelihood activities specifically in areas in and around PAs to alleviate pressure on these resources. ● Encourage population, health, environment initiatives in high population-growth areas throughout the country to help communities understand the linkage 	<ul style="list-style-type: none"> ● Land Tenure Challenges & Legacy of Conflict ● Climate Change 	<ul style="list-style-type: none"> ● Bush Fires ● Illegal, Unsustainable, and Poorly Regulated Fishing ● Climate Change ● Poaching, Subsistence Hunting, and Illegal Wildlife Trade ● Poor Agricultural Practices ● Mining

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<p>between unsustainable resource use and poor health and nutrition outcomes.</p>		
<p>ACTION 3: INCREASE ACCESSIBILITY AND AFFORDABILITY OF ALTERNATIVE ENERGY OPTIONS TO CHARCOAL AND WOOD FUEL.</p>		
<ul style="list-style-type: none"> • Develop a strategic environmental assessment or comprehensive planning process to guide concessions and investment, with a focus on energy. • Discourage reforestation with eucalyptus, encourage reforestation with native/indigenous species (as needed, eucalyptus can be used as charcoal during the energy transition and replanted with native trees). • Create a national policy on sustainable charcoal use while investing in research and initiatives for scalable alternative-energy sources (e.g., liquefied natural gas, solar, biogas). • Evaluate financial and policy incentives that encourage the adoption of energy alternatives or discourage the use of fuelwood (e.g., subsidizing gasification or fuel-efficient cook stoves, supporting a briquette enterprise.) • Promote entrepreneurship in energy-efficient technologies (e.g., cleaner and efficient cook stoves and burning systems). • Increase investment in and development of mini-grid solar or other forms of distributed energy to increase availability of electric power, particularly in isolated rural locations. • Upgrade and expand the electricity generation, transmission, and distribution infrastructure to increase access to low-cost, reliable power in urban and peri-urban areas. • Explore opportunities to invest/promote fuel-efficient cookstoves, with understanding that effective execution requires active monitoring of adoption and proper use (e.g., tracking changes in wood fuel use over time). • Facilitate establishment of community woodlots for sustainable fuelwood supply in urban and rural areas. 	<ul style="list-style-type: none"> • Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods • Lack of Energy Alternatives • Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity • Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors • Climate Change 	<ul style="list-style-type: none"> • Encroachment in Protected Areas and Human-Wildlife Conflict • Timber harvest for charcoal, firewood, and construction • Climate Change • Invasive Species
<p>ACTION 4: STRENGTHEN CLIMATE CHANGE AND DISASTER RESILIENCE EFFORTS (E.G., REDUCE THE IMPACT OF FLOODS, DROUGHT).</p>		
<ul style="list-style-type: none"> • Improve natural disaster preparedness and response capacity, including development of resettlement plans. Ensure plans for disaster preparedness are oriented toward sustainable NRM and biodiversity conservation practices, for example: 	<ul style="list-style-type: none"> • Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods 	<ul style="list-style-type: none"> • Encroachment in Protected Areas and Human-Wildlife Conflict

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<ul style="list-style-type: none"> ○ avoid planning for resettlement directly adjacent to protected areas, ○ embed a grievance redress mechanism to mediate conflicts over land, ○ plan for shelters that do not require deforesting the local area. ● Promote climate smart agriculture (e.g., crop varieties adapted to the climate and technologies which increase soil fertility), scaling of Farmer-Managed Natural Regeneration (FMNR)⁹ coupled with soil and water conservation measures. ● Integrate data on future climates into models of ecosystem services (e.g., hydrological models) or distribution of tree cover (e.g., communal lands) to better understand which natural resources are most vulnerable and emphasize linkages to the ecosystem services they provide that can contribute to natural resource planning (Underwood, Hahn, and Hollander 2020). 	<ul style="list-style-type: none"> ● Lack of Energy Alternatives ● Land Tenure Challenges & Legacy of Conflict ● Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity ● Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors ● Climate Change 	<ul style="list-style-type: none"> ● Climate Change ● Invasive Species

TIER 2: HIGH PRIORITY

ACTION 5: PROMOTE RESTORATION OF DEGRADED LANDSCAPES AND WATERWAYS.

<ul style="list-style-type: none"> ● Rehabilitate degraded waterways by increasing infrastructure for waste management nationally, targeting population centers and/or areas of environmental sensitivity. ● Identify priority landscapes (e.g., protected areas threatened by encroachment, such as Murehe forest and Malagarazi Ramsar Site) for landscape restoration, remediation, and reforestation in partnership with communities and civil authorities. ● Support reforestation programs at the state and local level, especially in degraded areas such as hillsides and waterways and determine which native species might be appropriate for reforestation efforts in light of climate change. ● Develop protected area management plans informed by assessments of local biodiversity. ● Target efforts that include endangered tree species and traditional medicinal species (i.e., sandalwood). 	<ul style="list-style-type: none"> ● Land Tenure Challenges & Legacy of Conflict ● Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors ● Climate Change 	<ul style="list-style-type: none"> ● Timber harvest for charcoal, firewood, and construction ● Climate Change ● Aquatic Pollution and Poor Solid Waste Management ● Mining
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⁹ FMNR is a low-cost land restoration technique used to combat poverty and hunger amongst poor subsistence farmers by increasing food and timber production and resilience to climate extremes. Farmers protect and manage the growth of trees and shrubs that regenerate naturally in their fields from root stock or from seeds dispersed through animal manure (Rinaudo 2000). More information on FMNR is available [here](#).

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<ul style="list-style-type: none"> • Support innovative payment for ecosystem services activities including forestry initiatives, and explore participation in Reducing Emissions from Deforestation and Degradation (REDD+) • Support work on landscape connectivity mapping (e.g., wildlife corridors) and efforts to improve dispersal of wildlife species across national boundaries. 		
<p>ACTION 6: STRENGTHEN NATURAL RESOURCES AND LAND USE GOVERNANCE (REGULATION, ENFORCEMENT, AND ACCOUNTABILITY) AT THE NATIONAL, REGIONAL, AND LOCAL LEVELS.</p>		
<ul style="list-style-type: none"> • Promote NRM Plans (e.g., plans for fisheries, mineral resources, rangelands, forests) which include, for example, linkages to family planning. • Train GOB officials (down to the local level) on sustainable management practices within their relevant sector (e.g., agriculture, livestock, aquaculture) to enable officials to better regulate current and future extraction activities and facilitate the transition of different economic sectors to a more sustainable use of natural resources. • Support equal capacitation and funding for conservation, environment, and climate change staff at the Ministry of Environment, Agriculture, and Livestock. • Develop and fund enforcement mechanisms to address key gaps in existing legal frameworks (e.g., land tenure process). • Support implementation of revised environmental laws, regulations, and national plans, including clarifying ambiguity of institutional mandates and responsibilities pertaining to NRM. • Strengthen forest governance through the effective implementation of legal and regulatory texts to reduce deforestation. • Support systematic application of environmental assessments for major development activities (e.g., mining, agriculture). Systematic application of environmental assessments must be supported by sufficient capacity for robust oversight, monitoring, and enforcement. • Introduce a wetlands management regime that clarifies oversight roles, strengthens protections and penalties for violation, and empowers protection of wetland areas. • Ensure sufficient human and financial resources are allocated to protected areas to preserve remaining populations of wild animals. 	<ul style="list-style-type: none"> • Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods • Land Tenure Challenges & Legacy of Conflict • Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity • Lack of Environmental Data and Monitoring • Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors • Climate Change 	<ul style="list-style-type: none"> • Encroachment in Protected Areas and Human-Wildlife Conflict • Timber harvest for charcoal, firewood, and construction • Poorly Regulated Infrastructure Development • Bush Fires • Illegal, Unsustainable, and Poorly Regulated Fishing • Climate Change • Poaching, Subsistence Hunting, and Illegal Wildlife Trade • Poor Agricultural Practices • Mining • Invasive Species

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<ul style="list-style-type: none"> ○ Support financial capacitation of OBPE, including hiring of additional protected areas staff, park ranger training programs, and development and maintenance of park infrastructure (e.g., vehicles for patrolling, roads maintenance). ○ Support the use of park entrance fees and funds collected from tourism for park operations and maintenance and allow some or all of these funds to remain within the park. ○ Strengthen enforcement—inclusive of equipment and training for enforcement officers—to prevent or reduce environmentally degrading activities (e.g., encroachment, poaching, sand mining) in protected areas and sensitive ecosystems. ○ Develop conservation plans for remaining large mammals (e.g., chimpanzees, hippopotamuses, leopards, crocodiles, water buffalo, waterbuck). ● Ensure sufficient human and financial resources are allocated to enforce the use of proper fishing gear and minimize overfishing. 		
<p>ACTION 7: IMPROVE NATIONAL, REGIONAL, AND LOCAL LAND USE PLANNING AND RESOLUTION OF LAND TENURE CONFLICTS.</p>		
<ul style="list-style-type: none"> ● Increase community access to the resources needed to formalize tenure arrangements. ● Support the reintegration of returned refugees and IDPs with a focus on settlement of land tenure conflicts and livelihoods support. ● Improve cross-sectoral coordination with all levels of government and the private sector to align efforts around land use planning and resource mapping and provide technical assistance to support implementation of land use plans. ● Digitize land tenure documentation and coordinate across all levels of government to improve timeliness of resolution of land conflicts and increase transparency around conflict resolution. ● Increase capacitation of the judicial system for timely resolution of land tenure disputes. ● Develop integrated land-use and water-resource management plans, coordinated across national, sub-national, and local levels of governance. These plans should account for the following: <ul style="list-style-type: none"> ○ Population growth and livelihood zones. 	<ul style="list-style-type: none"> ● Land Tenure Challenges & Legacy of Conflict ● Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity ● Lack of Environmental Data and Monitoring ● Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors ● Climate Change 	<ul style="list-style-type: none"> ● Poorly Regulated Infrastructure Development ● Climate Change ● Poor Agricultural Practices ● Mining

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<ul style="list-style-type: none"> ○ Agricultural development priorities and objectives. ○ Land tenure, concessions, and legal frameworks. ○ Existing protected areas, ecologically sensitive areas in/around protected areas (e.g., buffer zones), priority wildlife/biological corridors, and ecologically important areas that may require protection. ○ Areas prioritized for ecosystem restoration/recovery, as part of broader reforestation and other ecosystem restoration plans. 		
TIER 3: ADDITIONAL ACTIONS NECESSARY		
ACTION 8: INCREASE AVAILABILITY AND QUALITY OF EDUCATION AND RESEARCH INITIATIVES TO ADDRESS EXISTING GAPS IN AVAILABLE BIODIVERSITY DATA.		
<ul style="list-style-type: none"> ● Train staff in government, civil society, or through university study (in Burundi or abroad) to collect biodiversity data to fill gaps in available information. ● Increase investment in training for terrestrial and aquatic biologists and taxonomists to enhance ability for academia and/or civil society to conduct inventories of fish and wildlife resources, in turn enhancing ability to design spatial plans that properly account for biodiversity protection and management. ● Educate in-country experts and researchers to better inform governments and management policies. Provide long-term support to universities, research centers, and individual scientists, potentially via protected areas. ● Incorporate conservation-themed exercises and curricula into all levels of education (e.g., agricultural education focused on climate smart and good agricultural practices; reading and literary content discussing the value of Burundian biodiversity). ● Strengthen quality and broaden availability of environmental education and science and technology training focused on biology, ecology, and related disciplines relevant to biodiversity. ● Increase research opportunities for disciplines relevant to biodiversity (e.g., ecology, biology, zoology, and other environmental and ecological sciences) to improve capacity to properly monitor, manage, and conserve natural resources and ecosystem health and to increase key data on biodiversity and forests. ● Conduct the environmental analyses necessary to guide the setting of priorities for environmental recovery, resource management, and sustainable use planning. 	<ul style="list-style-type: none"> ● Poverty, Demographic Pressures, and Natural Resource Dependent Livelihoods ● Structural Constraints: Lack of Institutional and Human Resource Capacities for Biodiversity ● Lack of Environmental Data and Monitoring ● Weak Investment among Government, Bilateral, Multilateral, Private and NGO actors ● Climate Change 	<ul style="list-style-type: none"> ● Illegal, Unsustainable, and Poorly Regulated Fishing ● Climate Change ● Poor Agricultural Practices ● Invasive Species

TABLE 8. ACTIONS NECESSARY, DRIVERS ADDRESSED, AND LINKED THREATS ACCORDING TO TIER OF PRIORITY

ACTIONS NECESSARY	DRIVER(S) ADDRESSED	LINKED THREATS
<p>A sampling of these assessments may include current status of ecosystems, tropical forests, genetic diversity, collection of local and national geospatial data, the management status of existing protected areas, species counts.</p> <ul style="list-style-type: none"> • Prioritize and preserve indigenous knowledge in medicinal plants. • Devote resources to assure implementation of pesticide registration policies including ensuring quality of formulations in the market, use of pesticide in accordance with the approved label, and national environmental monitoring programs that aim to track influence of pesticide applications on surface water and groundwater quality and to determine the occurrence of pesticides in sediment, air, precipitation, and biota. 		

7 EXTENT TO WHICH THE ACTIONS PROPOSED FOR SUPPORT BY THE AGENCY MEET THE ACTIONS NECESSARY

The Mission does not receive dedicated funding for biodiversity. Below, we summarize the overlap between Actions Necessary and the Extent to Which the Mission is working to conserve and sustainably manage tropical forests and biodiversity.

TABLE 9. ACTIONS NECESSARY AND EXTENT TO WHICH

ACTIONS NECESSARY TO ACHIEVE CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY	EXTENT TO WHICH CURRENT MISSION PROGRAMMING CONTRIBUTES TO SUSTAINABLE MANAGEMENT AND CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY
<p>Action 1: Support ongoing efforts and gains in democratic stabilization to support an enabling environment for biodiversity conservation.</p>	<ul style="list-style-type: none"> • Dukire Tubane – Project objectives align with Action 1 by addressing underlying drivers of unrest. Project objectives include (a) strengthening the resilience and cohesion of Burundian youth affected by violence and (b) improving dialogue and social cohesion among political leaders and communities. Ongoing support does not directly incorporate any direct linkages to biodiversity conservation. • Tuyage "Let's Talk" – Project objective 1, expanding the cadre of professional journalist, aligns with Action 1, specifically with improved capacity of media and journalists. Ongoing support does not directly incorporate any direct linkages to

TABLE 9. ACTIONS NECESSARY AND EXTENT TO WHICH

ACTIONS NECESSARY TO ACHIEVE CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY	EXTENT TO WHICH CURRENT MISSION PROGRAMMING CONTRIBUTES TO SUSTAINABLE MANAGEMENT AND CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY
	<p>biodiversity conservation – such as including biodiversity messaging in media; however, this creates an opportunity for future programs.</p> <ul style="list-style-type: none"> • Turikumwe – Project objectives align with Action 1, by addressing drivers of political violence. Ongoing support does not directly incorporate direct linkages to biodiversity conservation.
<p>Action 2: Support food security, family planning, and economic growth initiatives aligned with priority biodiversity and forestry conservation goals.</p>	<ul style="list-style-type: none"> • Global Development Alliance on Coffee is aligned with Action 2. Specifically, education on sustainable coffee farming aligns with biodiversity objectives. Future similar agricultural support projects may offer opportunities to nurture, invest in, and scale-up, non-traditional sustainable value chains such as shade-grown coffee. • Tubiteho & Momentum Private Health Care Delivery: Family planning element of these two programs directly address action 2. There is an opportunity to link family planning with environment initiatives to help communities understand the linkage between unsustainable resource use and poor health and nutrition outcomes. • Tuyage "Let's Talk" - Project objective 3, addressing the norms and barriers limiting women's rights in economic participation and improving entrepreneurship skills training and access to markets, money, and mentorship for women, aligns with Action 2. Ongoing support does not directly incorporate any direct linkages to biodiversity conservation – such as linking increased opportunities for women's economic participation with natural resource management development projects; however, this opportunity exists future programs. • Turikumwe works with women to improve their access to economic opportunity through village savings and loans associations. Although this project does not directly incorporate any direct linkages to biodiversity conservation, there are opportunities to these themes into this type of future program.
<p>Action 3: Increase accessibility and affordability of alternative energy options to charcoal and wood fuel.</p>	<ul style="list-style-type: none"> • The Mission is not currently engaged in activities addressing Action 3.
<p>Action 4: Strengthen climate change and disaster resilience efforts (e.g., reduce the impact of floods, drought).</p>	<ul style="list-style-type: none"> • The Gatumba Disaster Assistance program aligns with Action 4. This program is largely focused on relief for displaced persons in response to natural disasters. Future opportunities for climate change resilience and disaster risk reduction would align best with this action.

TABLE 9. ACTIONS NECESSARY AND EXTENT TO WHICH

ACTIONS NECESSARY TO ACHIEVE CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY	EXTENT TO WHICH CURRENT MISSION PROGRAMMING CONTRIBUTES TO SUSTAINABLE MANAGEMENT AND CONSERVATION OF TROPICAL FORESTS AND BIODIVERSITY
Action 5: Reforestation and restoration of degraded landscapes and waterways.	<ul style="list-style-type: none"> The Mission is currently receiving any biodiversity funding and is therefore not currently engaged in activities addressing Action 5.
Action 6: Strengthen natural resources and land use governance (regulation, enforcement, and accountability) at the national, regional, and local levels.	<ul style="list-style-type: none"> The Mission is not programming in the natural resource and land use governance and is therefore not currently engaged in activities addressing Action 6.
Action 7: Improve national, regional, and local land use planning and resolution of land tenure conflicts.	<ul style="list-style-type: none"> Promoting Land Ownership Certification in Burundi program aligns with action 7 by supporting Burundian districts to establish their land rights registration services and making them operational.
Action 8: Increase availability and quality of education and research initiatives to address existing gaps in available biodiversity data.	<ul style="list-style-type: none"> The Mission is not receiving funds for educational programming and is therefore not currently engaged in activities addressing Action 8.

8 PROGRAMMING RECOMMENDATIONS FOR USAID/BURUNDI UNDER THE NEW STRATEGIC FRAMEWORK

This section presents the Analysis Team’s recommendations to USAID/Burundi on incorporating results into subsequent programming. By evaluating the extent to which Mission’s current or planned activities are meeting actions necessary, the Analysis Team developed recommendations that inform the strategic planning process. These recommendations are meant to strengthen the integration of tropical forests and biodiversity conservation in the Mission’s strategic framework and subsequent programming. In Burundi, the Analysis Team acknowledges the limitations on natural resource management programming both in terms of funding and the economic and socio-political situation, which must be stabilized before significant conservation advancements are made.

CATEGORY	DEFINITION
Readily Actionable	Recommendations that work within current programming to improve the extent to which USAID is addressing forestry and biodiversity conservation across sectors. These recommendations connect to existing or planned programming, but they could be short- or long-term actions that require either adaptive management of current programming or minor programmatic scope modifications.
Strategic Opportunity	These recommendations should be longer term and inform new directions for the upcoming CDCS. They guide the subsequent strategy and could represent a new type of programming, new geographic area of focus, or expansion/modification of existing or planned CDCS structure.

In accordance with USAID’s Best Practice Guidance for I18/I19s and as defined in the graphic above, recommendations are organized into two categories: “Readily Actionable” and “Strategic Opportunity.”

Recommendations and opportunities are provided in Table 11, which is organized by technical offices and an additional category labeled Cross-Cutting. This cross-sectoral programming could either be solely linked to a single technical office, or jointly linked across multiple Mission’s technical offices.

RECOMMENDATION	READILY ACTIONABLE	STRATEGIC OPPORTUNITY	HIGH PRIORITY
DEMOCRACY, HUMAN RIGHTS, AND GOVERNANCE			
Strengthen civil society – specifically organizations focused on integrated programs including environmental conservation.	X		X
Strengthen and support land tenure processes for local and indigenous people, including land rights for women.	X		
Promote capacity of media, including biodiversity messaging.	X		
Invest in capacity-building activities for government officials at every level to encourage development of innovative ideas related to NRM, sustainable livelihoods, and biodiversity		X	X

TABLE 11. RECOMMENDATIONS BY TECHNICAL OFFICE AND PRIORITY

RECOMMENDATION	READILY ACTIONABLE	STRATEGIC OPPORTUNITY	HIGH PRIORITY
conservation, and that address social and economic challenges.			
Support the government in strengthening implementation and enforcement of existing laws (i.e., that regulate forests/logging, mining) and developing strategies within the government to increase accountability.		X	X
Support the capacitation of environment staff at the Ministry of the Environment, Agriculture and Livestock. Engage with the GOB – to the extent feasible – on the importance of maintaining biodiversity over the long term.		X	X
Promote co-management of natural resources and benefit sharing arrangements with communities.		X	
ECONOMIC GROWTH			
Promote sustainable agroecology compatible with biodiversity such as organic farming practices, soil/water conservation, agroforestry, and fruit tree production. Where possible link to broader nutrition objectives.	X		X
Promote a policy of zero deforestation from agriculture and improve current agricultural practices to limit key threats.	X		X
Incorporate biodiversity conservation into the USDA School Feeding program (e.g., supporting charcoal alternatives, fuel efficient cookstoves, conservation messaging). ¹⁰	X		X
Improve efficiencies of existing agriculture or promote shifts to crops that are more efficient (i.e., offer improved yields and/or are nutrient and water efficient) and sustainable over the long term. Explore use of climate-resilient seed varieties with an awareness of the tradeoffs associated with nonnative or engineered seeds.	X		X
Work with farmers to improve access to markets, create efficiencies, and to support a value chain that makes sustainable products competitive and profitable. This may include the development of certification programs such as organic products, shade-grown coffee, or fair-trade programs – all of which are dependent on access to international markets. ¹¹	X		X

¹⁰ Large-scale food-service programs, such as the USDA School Feeding program, can have a significant (negative) effect on biological resources through the use of charcoal and fuelwood for cooking. Ensuring that environmental alternatives, such as fuel-efficient cookstoves, are used is essential to minimizing impacts on forests and trees and reducing air pollution which contributes to climate change. Planting trees for future use as fuelwood or as replacement for fuelwood is recommended.

¹¹ Agriculture that provides habitat features for species promotes biodiversity and can provide vital linkages across tropical forests. Shade-grown coffee, as an example, can be grown within with a canopy cover that provides important habitat for birds in tropical landscapes, which are increasingly threatened by deforestation. Other species including bees, arthropods, and lizards contribute to dynamic food webs that are supported by

TABLE 11. RECOMMENDATIONS BY TECHNICAL OFFICE AND PRIORITY

RECOMMENDATION	READILY ACTIONABLE	STRATEGIC OPPORTUNITY	HIGH PRIORITY
Support the systemic production and marketing of sustainable and/or biodiversity friendly agriculture such as shade-grown coffee. ¹¹	X		
Support local communities in or near protected areas by promoting sustainable livelihoods (e.g., beekeeping, producing charcoal alternatives) in those geographies.		X	X
Promote a systematic approach to energy development, including renewable energies. Support system-scale planning for nationwide energy development that compares a range of pathways, including different mixes of generation technologies and strategic siting to minimize impacts.		X	X
Support PPP's to build and expand ecotourism opportunities in protected areas/landscapes that incorporate benefit sharing with local communities.		X	
Support appropriate EIA and other environmental review of all development projects and ensure that biodiversity is adequately considered during project development.		X	
HEALTH			
Ensure that - in all areas receiving insecticide-treated bednets proximate to waterways - distribution is complemented by education on proper bednet use and the hazard of illegal and improper use for fishing. Support enforcement of proper bednet use and monitor other regional efforts at managing this issue to implement any locally appropriate solutions.	X		X
Promote health education in poor communities including integrated family planning, to address both land tenure concerns and demographic concerns driving threats to biodiversity identified in Section 5.1 above.	X		X
Continue or grow initiatives that indirectly but positively impact biodiversity (e.g., water, sanitation, and hygiene) and demonstrate the link between environmental conservation and a healthy population.	X		
Promoting research on sustainable use of medicinal plant species and promoting efforts that support their value and preservation.		X	
CROSS-CUTTING			
Engage with the International Visitor Leadership Program and promote opportunities to develop leadership and technical expertise within Burundi, specifically with respect to the environment and sustainable agriculture.	X		X
Explore participation in the USAID/Central Africa Regional Program for the Environment and USAID/East Africa Environmental Programs (e.g., Conserving Natural Capital	X		X

agroforestry. Generally, shade trees and agroforestry provide better habitat and support a more diverse wildlife community than managing fewer trees. In addition, the presence of tree cover on steep slopes in high-rainfall areas helps stabilize soil and minimize erosion.

TABLE 11. RECOMMENDATIONS BY TECHNICAL OFFICE AND PRIORITY

RECOMMENDATION	READILY ACTIONABLE	STRATEGIC OPPORTUNITY	HIGH PRIORITY
and Enhancing Collaborative Management of Transboundary Resources in East Africa project) that support transboundary collaboration.			
Promote environmental education at all levels, incorporating biodiversity values into school curricula beginning at primary school.		X	X
Invest in climate change mitigation and adaptation strategies in coordination with other opportunities and regulations such as REDD+, USAID’s sustainable landscapes. Promote the fulfillment of the Nationally Determined Contribution under the Paris Agreement.		X	X
Support efforts to collect, share, and manage biodiversity data.		X	
Promote the role of marginalized communities by promoting work in biodiversity monitoring and oversight for women, communities, and youth.		X	
Support ecosystems services valuations and/or other research initiatives that support conversation objectives.		X	

ANNEXES

Annex A: References

Annex B: Additional Maps, Graphics and Tables

Annex C: Conservation Success Stories

Annex D: Scope of Work

ANNEX A: REFERENCES

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ANNEX B: ADDITIONAL TABLES

TABLE 12. LAWS AND POLICIES GOVERNING BIODIVERSITY AND FOREST RESOURCE MANAGEMENT CONTINUED	
LAW/POLICIES	MAIN THEMES AND PROVISION
Law No. 1-40 of December 30, 2006 ratifying by the Republic of Burundi the Treaty on the conservation and sustainable management of forest ecosystems in Central Africa and establishing the Central African Forest Commission (COMIFAC)	This law ratifies the Treaty on the conservation and sustainable management of forest ecosystems in Central Africa and establishes the Central African Forest Commission (COMIFAC). The priority areas are the harmonization of forest and environmental policies, and the management and sustainable development of forest resources.
Law No. 1-04 of February 15, 2008 on the accession by the Republic of Burundi to the Bonn Convention on the conservation of migratory species belonging to wild fauna	This law approves adherence by the Republic of Burundi to the Convention on the Conservation of Migratory Species Belonging to Wild Fauna, or Bonn Convention.
Decree No. 100-95 of March 28, 2011 on the missions, organization and functioning of the Ministry of Water, the Environment, Regional Planning and Urbanism	This decree determines the missions, organization, and functioning of the Ministry of Water, Environment, Land Use Planning, and Urban Development.
National Strategy and Action Plan for the Development of the Non-Timber Forest Products Sector in Burundi (2016)	This strategy covers the sustainable management of Non-Timber Forest Products and the preservation of biodiversity to combat poverty and improve food security.
Decree No. 100/240 of October 29, 2014 establishing, missions, organization and operation of the OBPE	This decree sets out the attributions and prerogatives of OBPE.
Decree No. 100/233 of November 25, 2016 on the creation, missions, organization and functioning of the national committee for the reduction of emissions due to deforestation and forest degradation as well as the conservation of the “REDD+” carbon stock in Burundi	This decree creates within the Ministry of Water, the Environment, Regional Planning and Urbanism, a National Committee for the reduction of emissions due to deforestation and forest degradation as well as the conservation of carbon stock (REDD+), decision-making body for activities to reduce emissions from deforestation and forest degradation, sustainable management, forest conservation and enhancement of forest carbon stocks.
National Water Strategy (2011- 2020)	Guarantees the water needs of all water users are covered by the harmonious development of national water resources.
Decree on hunting and fishing, made enforceable by ordinance n° 49/Agri of July 30, 1937	The decree outlines the general regime for hunting and fishing, in particular the right to hunt, authorizations for natives, and permits for non-natives. This decree also includes the list of protected animals and taxes to be paid for each species.
Decree-Law No. 1/6 establishing national parks and nature reserves (1980)	This decree establishes national parks and nature reserves on the territory of Burundi and establishes the principles of conservation and protection relating thereto. It refers to successive decrees for the determination of the sites chosen to constitute parks or reserves, the delimitations, the system of protection and conservation of flora and fauna.
Regulation of hunting and protection of animal species (1971)	This ordinance outlines the regulation of hunting and measures to protect certain animal species. The twelve articles consider exercise of hunting rights, special hunting authorizations, prohibited hunting methods, protected species, of which, in the event of authorization to kill, the trophies must go to the Ministry of agriculture and animal husbandry.

TABLE 12. LAWS AND POLICIES GOVERNING BIODIVERSITY AND FOREST RESOURCE MANAGEMENT CONTINUED

LAW/POLICIES	MAIN THEMES AND PROVISION
Law n° 1-17 of September 10, 2011 on trade in wild fauna and flora	The law lays down the measures for the protection of species of wild fauna and flora against overexploitation from international trade.
East African Community (EAC) Strategy to combat poaching and illegal trade and trafficking of wildlife and wildlife products (2017)	The Combat Poaching and International Wildlife Trade Strategy sets out the process for sustainable management and conservation of wildlife resources in EAC
East African Community (EAC) Forestry Strategy (2021)	The EAC Forestry Strategy is designed to facilitate operationalization and implementation of the EAC Forestry Policy and ensure all EAC Partners States fulfill its objectives through harmonized implementation of the policy actions.
EAC Regional Biodiversity Strategy and Action Plan (2021)	The objectives are to: a) provide guidelines that build the region's capacity to implement provisions of the CBD; b) provide a framework for obtaining regional consensus on key biodiversity issues; c) act as a vehicle for forming partnerships with development partners on trans-boundary biodiversity issues; and, d) provide a framework for cooperation between Member States and with relevant multilateral environmental agreements.

Source: (FAO 2022b)

TABLE 13. COMMON AND SCIENTIFIC NAMES OF SPECIES CITED IN THE ANALYSIS

COMMON NAME	SCIENTIFIC NAME
African cherry	<i>Prunus africana</i>
African clarias catfish	<i>Clarias garipinus</i>
African evergreen sedge	<i>Cyperus latifolius</i>
African rock python	<i>Python sebae</i>
African savannah elephant	<i>Loxodonta africana</i>
African water buffalo	<i>Bubalus arnee</i>
African wild dog	<i>Lycaon pictus</i>
Air potato	<i>Dioscorea bulbifera var. anthropophagorum</i>
Aloe	<i>Allo vera</i>
Black cobra	<i>Naja melanoleuca</i>
Black-necked spitting cobra	<i>Naja nigricollis</i>
Black nightshade	<i>Solanum nigrum</i>
Black rhinoceros	<i>Diceros bicornis ssp. minor</i>
Black-winged pratincole	<i>Glareola nordmanni</i>
Blue goby cichlid	<i>Spathodus erythron</i>
Blue monkey or diadem monkey	<i>Cercopithecus mitis</i>
Bururi long-fingered frog or Mukuzira long-fingered frog	<i>Cardioglossa cyaneospila</i>
Cape wagtail	<i>Motacilla capensis</i>
Catfish	<i>Synodontis granulosus</i>
Cheetah	<i>Acinonyx jubatus</i>

TABLE 13. COMMON AND SCIENTIFIC NAMES OF SPECIES CITED IN THE ANALYSIS

Common bean or French bean	<i>Phaseolus vulgaris</i>
Common eland	<i>Taurotragus oryx</i>
Common tsessebe	<i>Damaliscus linatus</i>
Compressed cichlid	<i>Altolampologus compressiceps</i>
Crowned bullfrog	<i>Hoplobatrachus occipitalis</i>
Cumbungi or Southern cattail	<i>Typha domingensis</i>
Defassa waterbuck	<i>Kobus ellipsiprymnus ssp. defassa</i>
East African crane	<i>Balearica regulorum</i>
Eastern chimpanzee	<i>Pan troglodytes schweinfurthii</i>
Eastern gorillas	<i>Gorilla beringei</i>
Egyptian balsam	<i>Balanites aegyptiaca</i>
European honeybee	<i>Apis mellifera</i>
European rollers	<i>Coracias garrulus</i>
Fischer's lovebird	<i>Agapornis fischeri</i>
Fox's weaver	<i>Ploceus spekeoides</i>
Frotnosa cichlid	<i>Cyphotilapia frontosa</i>
Gabon Viper	<i>Bitis gabonica</i>
Giant rat's tail grass	<i>Sporobolus pyramidalis</i>
Goby cichlid	<i>Eretmodus cyanosticus</i>
Grauer's warbler	<i>Bradypterus graueri</i>
Grey crowned crane	<i>Balearica regulorum</i>
Grivet	<i>Cercopithecus aethiops</i>
Hadada ibis	<i>Bostrychia hagedash</i>
Helmeted guineafowl	<i>Numida meleagris</i>
Hippo grass	<i>Vossia cuspidata</i>
Hippopotamus	<i>Hippopotamus amphibius</i>
Igicunucu	<i>Plectranthus barbatus</i>
Iki-yoba	<i>Parinari curatelifolia</i>
Impala	<i>Aepyceros melampus</i>
Inyika	<i>Malapterurus tangaicaensis</i>
Inzinga	<i>Dinotropterus cunningtoni</i>
Isagara	<i>Pericopsis angolensis</i>
Julie cichlid	<i>Julidochromis regani</i>
Kigoma Agile Grasshopper	<i>Phymeurus kisuluensis</i>
Lake Tanganyika sardine	<i>Limnothrissa miodon</i>
Lake Tanganyika sprat	<i>Stolothrissa tangaicae</i>
Lantanas or red sage	<i>Lantana camera</i>
Leopard	<i>Panthera pardus</i>
Lichtenstein's hartebeest	<i>Alcephalus lichtensteini</i>
Lion	<i>Panthera leo</i>
Malabar spinach	<i>Basella alba</i>
Marshbuck or sitatunga	<i>Tragelaphus spekii</i>

TABLE 13. COMMON AND SCIENTIFIC NAMES OF SPECIES CITED IN THE ANALYSIS

Meyer's parrot	<i>Poicephalus meyeri</i>
Muyovu	<i>Entandrophragma excelsum</i>
Nile cabbage	<i>Pistia stratiotes</i>
Nile crocodile	<i>Crocodylus niloticus</i>
Nile monitor	<i>Varanus niloticus</i>
Nile tilapia	<i>Oreochromis niloticus</i>
Njekenjeke	<i>Cyperus latifolius</i>
Olive baboon or Anubis baboon	<i>Papio anubis</i>
Papyrus	<i>Cyperus papyrus</i>
Papyrus canary	<i>Crithagra koliensis</i>
Pennant's red colobus	<i>Piliocolobus pennanti</i>
Phragmites	<i>Phragmites mauritianus</i>
Plains zebra	<i>Equus quagga</i>
Puff adder	<i>Bitis arietans</i>
Red-faced lovebird	<i>Agapornis pullaria</i>
Red-necked spurfowl	<i>Francolinus afer</i>
Rugegewald River Frog	<i>Phrynobatrachus acutirostris</i>
Sandalwood	<i>Osyris lanceolata</i>
Sickle bush	<i>Dichrostachys cinerea subsp. Africana</i>
Silvergrass	<i>Miscanthus violaceus</i>
Steppe eagle	<i>Aquila nipalensis</i>
Tanganyika jewel	<i>Platycypha pinheyi</i>
Tanganyika lates	<i>Lates angustifrons</i>
Umugenge	<i>Acacia hockii</i>
Umugombe	<i>Chenopodium ugandae</i>
Umukoto	<i>Acacia polycantha var. campylacantha</i>
Umunyinya	<i>Acacia sieberiana var. vermoesenii</i>
Umusasa	<i>Hymenocardia acida</i>
Upside-down catfish	<i>Chiloglanis ruziziensis</i>
Water hyacinth	<i>Eichhornia crassipes</i>
West African mud turtle	<i>Pelusios castaneus</i>
West African slender-snouted crocodile	<i>Crocodylus Cataphractus</i>
West African viper	<i>Bitis nasicornis</i>
White-bellied pangolin	<i>Phataginus tricuspis</i>
White-headed vulture	<i>Trigonoceps occipitalis</i>
A flowering plant in the lily family	<i>Tracheophyta liliopsida</i>
A species of African bamboo	<i>Oxythenanthera abyssinica</i>
A species of freshwater mussel	<i>Brazzaea anceyi</i>
A species of freshwater snail	<i>Hirthis littorina</i>
A species of giant lobelia	<i>Lobelia mildbraedii</i>

ANNEX C: CONSERVATION SUCCESS STORIES

KIBIRA: FROM CONFLICT ZONE TO PEACE SANCTUARY

The political and security crisis that Burundi has experienced since 1993 has led to movements of internally displaced persons and refugees. Throughout the crises of the last thirty years, the populations around Kibira took refuge in the forest. Unable to return to their fields for security reasons, they were forced to live by hunting and gathering. Combatants also used the Kibira forest as a fallback zone. During this period of crisis, conservation efforts were halted, and Kibira forest, used as a refuge for both communities and combatants, was used for survival and, consequently, severely degraded.

In 1995, a group of women leaders, sensitive to the precarious conditions of women refugees in Kibira, came to the aid of these women to positively transform their lives. By working with women in Kibira to sensitize them to the socio-economic and environmental importance of the park, along with the support of a UN World Food Programme cash for work program, these women withdrew from the forest and formed an association for good coordination of interventions. This outreach by women leaders had a double impact: the living conditions of women in Kibira were improved and the degradation of the Kibira forest was reduced. Thus, in 2000, Association Femme et Environnement au Burundi, a non-profit association that formalized these efforts, was born and approved. It is made up of 90% of the women formerly housed in Kibira while men represent only 10% of the members. This proportion allows women to take the lead. It also has a youth section made up mainly of girls, in order to follow in the footsteps of their mothers.

In order to better contribute to the protection of Kibira and to improve the living conditions of their households, Association Femme et Environnement au Burundi has supervised various projects concerning nature conservation and self-development. Women have initiated income generating activities around handicrafts, market gardening, mushroom growing, and small livestock.

Now, the women from Kibira have regained a sense of life, their children have returned to school, they pay for health care and provide for other basic household needs, and they are already enjoying the dividends of Kibira's conservation.

At the same time, they are developing nurseries of agroforestry and forestry plants and are contributing to the reforestation and restoration of degraded areas of Kibira. A strip of more than 3 km by 60 m that had been destroyed during the crisis has been restored by the organization.

Those who used to contribute to the degradation of the forest have been transformed into ambassadors of conservation.

INVOLVEMENT OF BATWA COMMUNITIES IN THE MANAGEMENT OF PROTECTED AREAS. CASE STUDY OF THE BURURI FOREST NATURE RESERVE.

Between 2017 and 2018, a pilot project to integrate Batwa into conservation land was initiated in the Bururi Forest Nature Reserve (3300 ha) and has been subsequently replicated in the Ruvubu and Kibira national parks.

Beginning in 1997, a small Batwa community of 28 landless households, comprising a total of 130 people, had been living in the urban center of Bururi. This community illegally exploited the forest resources of the reserve for their survival. They cut down trees or quarried timber and sold it to the people of Bururi town to earn money to buy food. This direct dependence on the natural resources of the small Bururi forest constituted a direct threat and created many conflicts between the Batwa and site managers.

In order to resolve this conflict, with the support of the Burundi Coffee Zone Management Project and the World Bank, an approach to involve the Batwa community in the management of this protected area was successfully developed.

This experience consisted of integrating the Batwa in the development and management activities of the Bururi forest, while improving their living conditions using a "cash for work and solidarity savings" approach. The Batwa living in the periphery were employed in the management activities in return for remuneration. This payout was divided into two parts: 62.5% of the daily wage was paid normally after two weeks, while the remaining 37.5% was automatically transferred to a solidarity savings account opened in the name of the association.

Thus, in 2017, 28 Batwa households located in the urban center of Bururi organized themselves into an association called "Twitezimbere." This association was approved locally by the Commune of Bururi and an account was opened. It was through this account that the funds allocated to the integration activities of this community were transferred. This was the first time that this Batwa community opened an account in a bank.

The community was involved in the maintenance of 33 km of the reserve boundary and 15 km of internal trail, as well as the opening of 400 m of new trails leading to the Siguvyaye River falls, the development of a garden at the reserve office, and bushfire monitoring and control activities. A total of 53 adults, 27 women and 26 men, were involved in these activities on a daily basis for 17 months. The account was managed by a committee elected by the entire team of employees with the support of the reserve managers. Ultimately, the amount saved was used to purchase land according to the group agreement. The lack of land was identified by this community as their primary problem. After 17 months of their involvement in the management activities of Bururi Forest Nature Reserve, this community was able to save the equivalent of 12,000 US dollars. This amount allowed them to buy 3 ha of land, which they shared equally, to make bricks for their houses, to extract rubble for the foundations, and to draw a drinking water supply line. This experience has been fruitful because this small community now lives on its own land with housing acquired through their labor.

This effort has addressed multiple issues. It has improved the protection of the Bururi Forest Nature Reserve by reducing illegal logging and quarrying. Conflicts between the Burundi Forest Nature Reserve conservation services and the Batwa have given way to collaboration in the management of this

ecosystem. It has given hope to a desperate community, which now lives on its own land and in decent homes like other Burundians.

The Conservation and Community Change Organization continues to mentor this Batwa community to continue their involvement in the protection of the Bururi forest, materially supporting 50 Batwa children in school, and developing crafts in this community to ensure financial empowerment. In short, this approach of involving local communities, in this case the Batwa, in the protection of biodiversity clearly contributes to the consolidation of peace in a country and community empowerment.

ANNEX D: STATEMENT OF WORK



Environmental Compliance Support (ECOS) Contract

USAID/Burundi FAA 118/119 Analysis

ACTIVITY SPECIFICATION (AFR-061)

Submitted 8 December 2021

ECOS OVERVIEW

To advance developing countries' journey to self-reliance, USAID safeguards people and resources by systematically addressing environmental risk. USAID developed the Environmental Compliance Support (ECOS) contract to provide USAID staff and implementing partners worldwide with technical, educational, and knowledge management assistance to facilitate compliance with 22 Code of Federal Regulation (CFR) 216, Foreign Assistance Act (FAA) Sections 117/118/119, regulatory requirements, and executive order and policy objectives. A single, Agency-wide contract called ECOS offers a consistent, quality approach to environmental compliance across the Agency, minimizes duplication of systems and effort, facilitates the sharing of lessons learned, reduces compliance risks, provides training, facilitates capacity building, and reduces transaction costs of Missions and operating units seeking access to environmental compliance and related services.

ACTIVITY NUMBER

AFR-061 Under Contract No.: GS00Q14OADU119/ Order No. 7200AA18N00001

USAID BUREAU/MISSION/OFFICE

USAID/Burundi

BACKGROUND

As part of the documentation for the 2020-2024 Integrated Country Strategy (ICS), USAID/Burundi is compelled by Sections 118 and 119 of the Foreign Assistance Act (FAA), as amended, to prepare an analysis of tropical forests and biodiversity in Burundi. By mandating an FAA 118/119 analysis (hereafter referred to as "the analysis"), the U.S. Congress is recognizing the fundamental role that tropical forests and biodiversity play in sustainable development. Based on this analysis, USAID/Burundi will define to what extent the ICS will contribute to biodiversity conservation needs in Burundi. The analysis will assist in strengthening the mission's role in biodiversity conservation by integrating biodiversity and tropical forest conservation into the ICS.

SUMMARY OF RELEVANT PARTS OF FAA SECTIONS 118 AND 119

FAA Sections 118 and 119, as amended, require that USAID Missions address the following:

1) FAA Section 118 Tropical Forests

(e) **COUNTRY ANALYSIS REQUIREMENTS.** Each country development strategy, statement, or other country plan prepared by the Agency for International Development shall include an Analysis of:

- 1) The actions necessary in that country to achieve conservation and sustainable management of tropical forests, and
- 2) The extent to which the actions proposed for support by the Agency meet the needs thus identified.

2) FAA Section 119 Endangered Species

(d) **COUNTRY ANALYSIS REQUIREMENTS.** Each country development strategy, statement, or other country plan prepared by the Agency for International Development shall include an Analysis of:

- 1) The actions necessary in that country to conserve biological diversity, and
- 2) The extent to which the actions proposed for support by the Agency meet the needs thus identified.

The analysis for USAID/Burundi must adequately respond to the two questions for country strategies, also known as “actions necessary” and “extent to which.” As part of the documentation, USAID/Burundi is required to prepare an analysis of tropical forests and biodiversity in Burundi. The analysis will inform Burundi Mission’s programming and determine the extent to which it contributes to the actions necessary to effectively conserve and manage biodiversity in Burundi, and opportunities—within Mission means and mandate—for that contribution to be enhanced.

PURPOSE

The primary purpose of this task is to conduct an analysis of tropical forests and biodiversity in compliance with Sections 118 and 119 of the FAA of 1961, as amended, and USAID guidelines. The analysis will inform USAID/Burundi in the development of its ICS. USAID’s approach to development requires that the Agency examine cross-sector linkages and opportunities to ensure a robust development hypothesis. Biodiversity conservation is a critical approach for achieving sustainable development and should be considered in mission strategic approaches to improve development outcomes. The analysis therefore is an opportunity for the mission to better understand the strategic linkages between the conservation of a country’s tropical forest and biodiversity and development, so that it can structure a sound results framework to support future programming.

Notably, the analysis will identify strategic linkages at the results framework level, highlighting opportunities to integrate tropical forest and biodiversity conservation into priority development sectors identified in the ICS.

Climate change is a concern in Burundi. As such, the analysis will evaluate the threat to the country's tropical forest and biodiversity from climate change. In addition to evaluating the climate change threat to biodiversity and tropical forests, the analysis team should consider climate change as a cross-cutting risk factor and should analyze and incorporate climate change, as appropriate, throughout the report. Climate change vulnerabilities should also be considered when developing the report's recommendations. The analysis team should identify innovative, integrated strategic approaches that link tropical forest and biodiversity conservation to all USAID technical sectors, and to climate change.

MISSION PROGRAM

The current Mission ICS is under revision and expected to be finalized in early 2022 with the goal of accelerating Burundi's progress to sustainable development. The achievement of this goal is to be supported by three Mission Goals:

- MO1: Invest in People: Burundian systems for health and education are strengthened.
- MO2: Invest in the Economy: The foundation for a stronger Burundian economy is created through investment, employment, profitable value chains, and sound agricultural and environmental practices.
- MO3: Invest in Society and the Region: Burundi is a peaceful, open, and stable actor at home and in the region.

Note: The current Mission ICS is under revision and expected to be finalized in early 2022. [mission to confirm timing].

STATEMENT OF WORK

To achieve the above-stated purpose, the analysis team, under the direction of the Activity Manager, will proceed as described in this section. This analysis will mainly involve synthesis and analysis of existing information, coupled with key stakeholder consultations and site visits to ground-truth information. Under the direction of the Activity Manager, the analysis team will evaluate the status of tropical forests and biodiversity in Burundi. The focus of the work will be twofold: A) Identify actions necessary to conserve tropical forests and biodiversity and the extent to which the mission meets the actions necessary, and B) Develop recommendations that will guide the mission in updating the "extent to which" in the new country strategy.

Given the current impacts, both known and unknown, of the COVID-19 pandemic, for which there will likely be effects into the foreseeable future; personnel assignments, travel restrictions and other government mandates, may constrain our ability to conduct our services and provide deliverables as envisioned in this specification. ECOS reserves all rights to revise the delivery schedule and price due to such impacts from COVID-19 and will provide written notice of such proposed changes as needed.

Upon notification to the USAID AM, ECOS will collaborate with the Mission in developing and implementing an alternative strategy for meeting the goals for the deliverables.

Specifically, the SOW is written to include site visits conducted by the US-based leads and in-country consultants. However, the travel by the US-based staff is dependent upon the following:

- Receipt of USAID/Burundi RSO approval for travel by US-based team;
- Mission approval for travel by in-country consultants;
- ICF and Cadmus management approval of travel by ICF and Cadmus US-based team;
- Establishment of provisional budget (beyond that currently enumerated below) for Burundi-based quarantine for two weeks should the need arise;
- Establishment of provisional budget (beyond that currently enumerated below) for LOE during Burundi-based quarantine for two weeks should the need arise;
- Practicable international travel arrangements (e.g., flight itineraries and hotel availability) and Burundi entry requirements; and
- Adherence to Burundi national COVID restrictions and guidelines regarding travel.

Should any of the above provisions result in the inability of the US-based team to travel to Burundi, ECOS will limit the travel to the in-country consultants and adjust the work plan accordingly.

TASK 1. DESK-BASED DATA COLLECTION AND ANALYSIS

ECOS will gather and begin to analyze existing information to identify tropical forests and biodiversity status, key biodiversity issues, stakeholders, policy and institutional frameworks and gaps in the available information. Reports and other documentation to be reviewed include previous I18/I19 analyses (and/or ETOAs), current ICS and project documents, information available online on biodiversity and tropical forest conservation, project and activity reports and evaluations, national biodiversity conservation strategies and state of the environment reports, and information from development partners. Any additional background documents USAID wishes to specifically incorporate into the analysis must be provided to the analysis team. Any specific spatial data the Mission and/or the Africa Bureau wishes to use must be specified and publicly available or provided by USAID.

TASK 2. WORK PLAN AND LOGISTICAL PREPARATIONS

Note: The activities described in this section may occur prior to, or in parallel with, desk-based data collection.

- In coordination with the Mission, via bi-weekly (or other frequency decided with the Mission) planning meetings, begin planning the Work Plan and logistics for in-country site visits based on the mission's recommendations and on the team's preliminary desk-review. These meetings will also help identify the protocol for approaching USAID partners, the host country government, and other organizations for consultation and other requests related to the assignment.
- In coordination with the Mission, the team should initiate US-based consultations to key US-based stakeholders, including within USAID, other parts of the U.S. Government, and non-governmental and private-sector actors.

- Develop and submit a draft work plan 15 days after the kick-off meeting (Deliverable 1). The draft work plan will include a schedule of tasks and milestones, assessment methods, proposed assessment tools and a discussion of information gaps. The draft work plan will also include the following:
 - The type of information to be obtained and the key people to engage throughout the analysis process including USAID/Burundi staff, implementing partners, host country government officials, development partners, non-governmental organizations and private sector partners.
 - Map of locations of biodiversity importance and areas of ecological importance to help inform the analysis and potential site-based visits.
 - Itinerary for in-country or virtual consultations and site-based visits, based upon information made available by the Mission regarding existing programming, areas of known concern and areas being considered for future programming.[ECOS understands list of potential site visits is forthcoming from mission].
 - Key informant interview guides to be used for stakeholder consultations.
 - Report outline based on the outline attached to the SOW (refer to Annex A, Analysis Report Annotated Outline in the FAA 118/119 Best Practices Guide), with differences noted and explained.
 - Schedule for written progress reports to, or calls with, the activity manager and bi-weekly check-ins thereafter during the in-country work. If calls are chosen, they will be documented with written call notes provided to the USAID/Burundi activity manager.
- Finalize the work plan following receipt of Mission comments and suggestions on the draft work plan.

TASK 3. MISSION AND IN-COUNTRY CONSULTATIONS AND SITE-BASED VISITS

In coordination with the activity manager, the analysis team will:

- Meet with the key Mission technical staff engaged in Mission coordination and management of the analysis and program office to:
 - Orient the attendees to the overarching objective of the 118/119 analysis, the methodology to be used, and the agreed upon itinerary per the approved work plan. Ideally this will have already been circulated within the Mission prior to the team's arrival in the country.
 - Review the approach to the assignment with the Mission and learn specific Mission areas of interest or concerns regarding the planned itinerary and consultations.
 - Identify any additional organizations to be contacted.
 - Learn of any sensitivities related to the exercise (e.g., political constraints, Mission challenges in working with the host country government, or other generalized in-country implementation challenges) that could refine the analysis team's consultations

- and strategic or programming recommendations (i.e., the potential for raising expectations and the need to be clear about the purpose of the analysis).
- Understand the Mission’s planned timeline for new ICS development (if not already clarified).
- Gain an understanding of the status of the new ICS development/results framework and anticipated changes to overarching strategic goals and/or development objectives, to the extent they are known at that time.
- Meet with the USAID/Burundi front office to:
 - Review the purpose and importance of the analysis, emphasize the role of the entire Mission and help set expectations for the analysis process and use of the report.
- Meet separately with all Mission technical teams to:
 - Understand current programming (geographic areas of focus, earmarks and related mandates or constraints) and the ways in which it supports the actions necessary to conserve and sustainably manage biodiversity.
 - Learn about planned or potential future programming or strategic orientation.
- Conduct site visits to supplement information gathered from consultations, literature review and other second-hand sources. Site visit locations will be finalized in consultation with the mission through the Work Plan.
- Conduct an exit briefing prior to departure with the Mission, including the Front Office, Mission management, program office and all technical teams, to provide them with an overview of the analysis and preliminary report findings (Deliverable 2). The format for the exit briefing will be a 2-hour in-person or virtual workshop with Mission staff across Development Objectives to collaboratively develop cross-sectoral recommendations and present and discuss analysis and findings.

TASK 4. PREPARATION OF FAA 118/119 ANALYSIS

Under this task, ECOS will:

- I. Prepare and submit draft report (Deliverable 3). The analysis team will synthesize the information gathered and will prepare a draft Analysis report in accordance with the outline (see Annex A) and responsive to the legislative requirements listed in the “Summary of Relevant Parts of FAA Sections 118 and 119,” above. The report will:
 - a. Follow the outline and include the information recommended in Annex A at the end of this activity specification; and one to two success stories (one pager) in conservation initiatives.
 - b. Have a length of between 40-80 pages (excluding annexes) and submitted for review by USAID.
 - c. Be copy edited, formatted, and comply with USAID branding requirements.

The FAA 118/119 analysis draft and final reports will follow the outline of the FAA 118/119 Best Practice Guide and should include the following maps and tables:

- Map of main ecosystems in the country;
- Map of the forested areas and land uses;

- Map of protected areas, including forest reserves;
- Map of aquatic and marine resources;
- Protected area status table with a list of all declared and proposed protected areas (national parks, wildlife reserves and refuges, forest reserves, sanctuaries, hunting preserves, etc.); institution(s) responsible for the protection and management of each protected area; area of coverage; and to the extent feasible or desirable, ecosystems contained in each protected area;
- Table or description of the status of natural resources outside protected areas including for example land cover and land-use type (e.g., wetlands/freshwater sources, major catchment areas, agricultural ecosystems, etc.); institution(s) responsible for management; an overview of the major threats and challenges to conserving biodiversity outside protected areas.
- Table of conservation initiatives including: a list or description of the main conservation initiatives implemented by government, donors, non-governmental organizations, private sector and universities; brief evaluation of effectiveness; implementation dates; and funding levels (to the extent feasible).

The mission review period for the draft report will be 20 working days. The mission should send the Analysis to the relevant Regional Bureau and Pillar Bureau staff in Washington for their review and concurrence. *Note: ECOS recommends additional five (5) working days (from 18 August 2021 SOW) to account for review by USAID/East Africa Regional Mission, USAID/AFR and/or USAID FAB office personnel.*

2. Submit revised report (Deliverable 4). Following receipt of a consolidated set of USAID comments on the draft report, the analysis team will prepare and submit a revised report (Deliverable 4) within 20 working days that incorporates USAID comments. ECOS will conduct an editorial review of the report. Upon the USAID AM's approval of the revised report, ECOS will prepare a 508-compliant version of the final report.

508 Compliance and DEC Posting: All FAA 118/119 Analyses will be posted on the DEC (Development Experience Clearinghouse) and ECD (Environmental Compliance Database) which necessitates the document be rendered 508 compliant. Upon receipt of direction from the USAID Activity Manager, ECOS will upload the FAA 118/119 onto the DEC and ECD.

OVERVIEW SCHEDULE AND LOGISTICS

The assignment is expected to last 5-6 Months from the mobilization of the team to submission of the final deliverable. This includes 5-6 weeks of preparations, approximately two (2) weeks of in-country consultations and site-based visits, 3-4 weeks to produce the draft report following in-country work, 3-4 weeks for USAID review of the draft report, and 3-4 weeks to produce the final report. A more detailed schedule will be developed as part of the Work Plan process.

TABLE 1: WEEKLY ACTIVITIES AND MILESTONES

WEEK	ACTIVITY/MILESTONES
Week 1	Kick-Off Meeting Familiarization with USAID Burundi program and country context
Week 2, 3	Develop Work Plan
End of week 3	Draft Work Plan submitted to USAID (Deliverable 1)
Weeks 4, 5, 6	Desk-based Data Collection and Analysis and Logistical Preparations <ul style="list-style-type: none"> • Secondary data review and research • Consultations with U.S.-based stakeholders
Weeks 7 and 8 (pending schedule constraints)	<ul style="list-style-type: none"> • Site visits (February - March time frame) • In-briefing with USAID Activity Manager and USAID core team • Meetings with USAID front office, program office and technical teams
End of Week 8	Preliminary Findings at Out-briefing/Workshop (Deliverable 2)
Weeks 9, 10, 11, 12	Report writing
End of week 12	Submission of Draft Report (Deliverable 3)
Weeks 13, 14, 15, 16	USAID review of Draft Report, and submission of consolidated comments (Per Task 3 above, USAID is requesting 20 to 30 days for review of draft report)
Weeks 17, 18, 19, 20	Revision of the USAID Reviewed Draft Report (inclusive of consolidated USAID Comments)
End of week 20	Submission of Revised Report (Deliverable 4)
Week 21	USAID Approval of Revised Report
Week 22	Preparation of 508 Compliant Final Report
End of week 22	Submission of Final Report

DELIVERABLES

Table 2 presents the deliverables for this activity specification.

TABLE 2: ACTIVITY SCHEDULE WITH DELIVERABLES

TASK	DELIVERABLE	SCHEDULE
Task 2	Deliverable 1: Draft Work Plan and schedule. The Work Plan will address all elements specified in the SOW.	Within 15 days of the kick-off meeting.
Task 4	Deliverable 2: Exit briefing/workshop, and associated media such as PowerPoint, prior to the Analysis Team's departure from the country or at a time requested by the Mission if the team is locally based or unable to travel.	Last day of in-country site visits or at completion of virtual consultations.
Task 5	Deliverable 3: Draft FAA 118/119 Analysis report, conforming to all requirements specified in the SOW.	Within 20 working days after the conclusion of in-country work or at a time requested by the Mission if the team is locally based.

Task 5	Deliverable 4: Revised report incorporating all comments, conforming to all requirements specified in SOW.	Within 20 working days of the receipt of consolidated set of USAID review comments on the draft Analysis.
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ROLE OF THE USAID MISSION

USAID acknowledges that substantial Mission engagement is required in support of the analysis team. To this end, the Mission is responsible for arranging the following prior to the analysis team’s arrival in-country:

- Scheduling separate consultation meetings with the activity manager and the 1) program office, 2) front office, and 3) each of the Mission technical offices.
- Scheduling the day/time for the exit briefing presentation or workshop.

Effective Mission support includes providing the analysis team with the following:

- A list of key USAID (Mission-wide activity descriptions, reports, and evaluations) and relevant documents to review with links or copies of the documents;
- A list of recommended stakeholders for consultations with contact information;
- Candidate site-based visits or key criteria to support analysis team identification of potential site-based visits;
- A list of relevant donor projects as available;
- A list of USAID programs for each technical team with brief descriptions of technical remit, A/COR (and contact info), implementing partners (and key points of contact) and maps, ideally a country map showing the geographic location of all programs;
- Assistance to the team in making initial contact to arrange interviews, particularly to host country government stakeholders for whom USAID Mission outreach is often required;
- Preparation of letters of introduction, as needed;
- Logistics recommendations for site-based visits, i.e. suggestions for lodging, in-country travel, rental car agencies, logistics specialists, and translation services;
- Assistance with security/safety in Burundi; and
- Review and feedback on the draft analysis report (including liaising with both the Africa Bureau and USAID/Washington for review and approval of the analysis report).

Whenever possible Mission staff will accompany the analysis team on site visits and to interviews with key stakeholders.

To ensure continued coordination with the Mission over the course of the project, the analysis team will schedule regular meetings (bi-weekly) with the activity manager to discuss progress, challenges, issues, and key findings to-date. Monthly progress reports will also be provided.

USAID MANAGEMENT AND ENGAGEMENT

ECOS will take direction from Chantal Ninteretse, USAID/Burundi Program Development Specialist, as the USAID Activity Manager for this activity. As needed, ICF will take direction from the COR, Teresa Bernhard, Alternate COR, Will Gibson, and Contracting Officer (CO), Roderick Watson.

STAFFING AND OTHER RESOURCES

THE ANALYSIS TEAM SHALL INCLUDE A TEAM LEADER, WITH THE FOLLOWING QUALIFICATIONS:

- Post-graduate qualifications (master's level degree or higher) in biology, ecology, zoology, forestry, ecosystem conservation, political economy, political ecology, environmental policy, environmental planning, or a closely related field;
- Knowledge of USAID's strategic planning process both broadly and as related to tropical forests and biodiversity;
- Expertise in assessing environmental threats;
- Experience in the geographical region and, preferably the specific country;
- Experience coordinating analyses and leading teams;
- Exceptional organizational, analytical, writing and presentation skills; and
- Fluent in English and preferably the language spoken in the Analysis country (i.e., French or Kirundi).

Including Team Leader, the exact team composition shall be proposed for approval by the Mission and should ensure appropriate qualifications and technical expertise tailored to the types of programming and environmental conditions prevalent in the specific country or region of focus.

- Post-graduate qualifications (master's level degree or higher) in biology, ecology, zoology, forestry, ecosystem conservation.
- Agricultural, governance, health or other non-environment sector specialist who will focus on linkages between tropical forests, biodiversity, and other key technical sectors.
- Aquatic resources specialist.
- Environmental political economist, or political ecologist, that understands the human dimensions of conservation and natural resources management and diverse conservation and management problems including, but not limited to, water, governance, fisheries management, wildlife management, agriculture, economic growth, extractive industries, protected areas, and the scale of the issue, from local, to regional to global.
- GIS expertise or access to GIS expertise to help identify, use, and analyze geospatial data and maps.

The comprehensive roster of anticipated ECOS staffing for this activity is presented in the table below. ECOS will adjust the staffing of non-key positions as necessary to meet the needs of the activity and as deemed appropriate by the ECOS Project Manager (PM), including use of additional ECOS labor categories, as needed.

Paola Bernazzani will serve as ECOS Activity Manager, Biodiversity Specialist and Team Leader, and Jaime Capron will serve as the Cadmus Manager, Governance Section/USAID Planning Process

Specialist, and Deputy Team Leader. ECOS staffing for other key positions for the Analysis is indicated below.

- ECOS Program Manager – Diana Pape, ICF
- ECOS Deputy Program Manager – Patrick Hall, Cadmus
- ECOS Activity Manager, Biodiversity Expert (Team Leader) – Paola Bernazzani, ICF
- Governance Sector and USAID Planning Process Specialist (Deputy Team Lead) – Jaime Capron, Cadmus
- Climate Change Specialist – Molly Helmuth, ICF
- Ecosystem Services – Andrew Kindle, ICF
- Aquatic Biodiversity Specialist; Biodiversity Expert - Jason Hassrick
- Burundi-based Conservation, Forestry, and Livelihoods Experts (TBD)*

*CVs for local experts will be presented for USAID review and acceptance concurrent with work plan development (Task 1).

Anticipated full ECOS staffing for this activity is presented in the Table 3 below. ECOS will adjust the staffing of non-key positions as necessary to meet the needs of the activity and as deemed appropriate by the ECOS Program Manager, including use of additional ECOS labor categories, as needed.

TABLE 3: ESTIMATED STAFFING AND HOURS FOR ACTIVITY AFR-061 BURUNDI FAA 118/119 ANALYSIS				
NAME	FIRM	LABOR CATEGORY	HOURLY RATE	HOURS
Diana Pape	ICF	Environmental Scientists and Specialists, Including Health - Scientist and Science Technician, Group 3 - Senior	\$279.90	16
Paola Bernazzani	ICF	Natural Sciences Managers - Manager, Group 2 - Senior	\$193.61	212
Jaime Capron	Cadmus	Environmental Scientists and Specialists, Including Health - Scientist and Science Technician, Group 3 - Journeyman	\$119.86	264
Molly Hellmuth	ICF	Natural Sciences Managers - Manager, Group 2 - Senior	\$193.61	24
Andrew Kindle	ICF	Economist-Senior	\$173.57	16
Josh Habib	Cadmus	Natural Sciences Managers - Manager, Group 2 - Senior	\$193.61	24
Patrick Hall	Cadmus	Natural Sciences Managers - Manager, Group 2 - Senior	\$193.61	16
Jason Hassrick	ICF	Environmental Scientists and Specialists, Including Health - Scientist and Science Technician, Group 3 - Journeyman	\$193.61	48
Mark Stoughton	Cadmus	Natural Sciences Managers - Manager Group 2 - SME	\$260.16	8
Local Consultant: Forestry & Conservation	Cadmus	Forest and Conservation Technicians - Senior	\$90.75	136

TABLE 3: ESTIMATED STAFFING AND HOURS FOR ACTIVITY AFR-061 BURUNDI FAA 118/119 ANALYSIS

NAME	FIRM	LABOR CATEGORY	HOURLY RATE	HOURS
Local Consultant: SIA & Rural Livelihoods	Cadmus	Environmental Science and Protection Technicians, Including Health -Scientist and Science Technician, Group 5 - Journeyman	\$82.29	136
Laura Simmons-Stern	Cadmus	Environmental Scientists and Specialists, Including Health - Scientist and Science Technician, Group 3 - Journeyman	\$119.86	120
Carmen Saab/Jesse Gibson	Cadmus	Natural Sciences Managers - Manager, Group 2 - Junior	\$88.94	120
Jodi O'Grady	Cadmus	Environmental Scientists and Specialists, Including Health - Scientist and Science Technician, Group 3 - Journeyman	\$119.86	24
Bethlehem Kavaleri	ICF	Administrative Professional - Senior	\$145.21	16
Total Hours				1,180
Total Labor Dollars				\$157,499
Travel				\$15,423
ODCs				\$4,756
Total Activity Ceiling				\$177,678

TABLE 4: ESTIMATED TRAVEL COSTS

DESCRIPTION	NOTES	QUANTITY	UNIT COST*	COST
Airfares + Airport Transfers				
International Flight	Washington, D.C. (DCA or IAD) → Bujumbura (BJM) round-trip (J Capron)	1	\$1,779	\$1,779
International Flight	Cleveland, OH (CLE) → Bujumbura (BJM) round-trip (P Bernazzani)	1	\$2,400	\$2,400
Airport Transfer	international arrival/departure in Burundi (J Capron & P Bernazzani)	4	\$59	\$237
Airport Transfer	domestic (J Capron & P Bernazzani)	4	\$59	\$237
Per Diems				
transit per diem: M&IE	assumes Brussels both directions @ 75% (J Capron & P Bernazzani)	4	\$117	\$468
Burundi: Bujumbura	int'l arrival & departure; in- and out-briefings; consultations (J Capron & P Bernazzani)	14	\$199	\$2,786

TABLE 4: ESTIMATED TRAVEL COSTS

DESCRIPTION	NOTES	QUANTITY	UNIT COST*	COST
Burundi: "Other"	Team A: up-country site visits & consultations (locale[s] TBD) (1 U.S.-based + 1 local IC for 7 days)	14	\$199	\$2,786
Burundi: "Other"	Team B: up-country site visits & consultations (locale[s] TBD) (1 U.S.-based + 1 local IC for 7days)	14	\$199	\$2,786
Other				
TDY communications	(2 U.S.-based travelers for 2 weeks)	28	\$18	\$504
TDY communications	(2 local consultants for 10 days/each)	10	\$18	\$180
local transport and taxis	in/around Bujumbura	7	\$60	\$420
Medical/medevac	(2 U.S. based travelers)	2	\$300	\$600
visa	Burundi visa (2 U.S. based travelers)	2	\$120	\$240
Total				\$15,423

TABLE 5: ESTIMATED OTHER DIRECT COSTS (ODCS)

DESCRIPTION	QUANTITY	UNIT COST*	COST
4x4 vehicle hire (includes driver & fuel)	14	\$251	\$3,514
consultant telecoms - (2 local consultants @ 2 weeks of non-field work/each)	28	\$13	\$364
Park entrance fees	1	\$627	\$627
Subtotal (of ODCs listed above)			
DBA (All applicable personnel)			\$251
TOTAL			\$4,756

BUDGET AND FUNDING SOURCES

Upon approval of this Activity, the approved ceiling cost for this activity shall be \$177,678. This budget includes \$15,423 for travel and \$4,756 for ODCs. Per requirement of the ECOS award, travel and ODC charges accrue to CLIN 2, which currently contains only E3 funds. Travel and ODCs charges need to be invoiced against E3 CLIN 2 travel and ODC funds. This expenditure of E3 funds will be reimbursed to

E3 as labor to E3 ECOS activities against the Mission funds obligated to CLIN 1 (Labor). Table 6 presents the accounts programmed to AFR-061.

TABLE 6: ACCOUNTS USED TO FUND ACTIVITY AFR-061 AND PROGRAMMED FUNDING					
ACCOUNT LINE NO.	BBFY/EBFY FUND	BUREAU	OPERATING UNIT	ACCOUNT OBLIGATED FUNDING	FUNDING PROGRAMMED TO ACTIVITY
231 – MOD 12	19/20 DV	AFR	BURUNDI	\$120,000	\$107,400
375 – MOD 18	20/21 DV	AFR	BURUNDI	\$190,385	\$70,278
2 – CLIN 2	17/18 DV	EGEE	EGEE/PLC	\$750,000	\$20,179
375 – MOD 18	20/21 DV	AFR	BURUNDI	\$190,385	-\$20,179
TOTAL LABOR (CLIN 1)					\$157,499
TOTAL TRAVEL (CLIN 2)					\$15,423
TOTAL ODCS (CLIN 2)					\$4,756
ACTIVITY CEILING					\$177,678

ACTIVITY SPECIFICATION PREPARED BY

ECOS

DATE SUBMITTED TO USAID

11 November 2021; 8 December 2021

REPORTING

Monthly technical and financial status reports will be provided via the ECOS monthly performance reporting (MPR) process. *Ad hoc* status reports will be provided by the ECOS Activity Manager on request of the USAID Activity Manager or ECOS COR.

CLEARANCES

Name(s)	Title & Mission/Office	Date	Role
Chantal Ninteretse	Program Development Specialist, USAID/Burundi/Deputy MEO		USAID Activity Manager (AM)
Jean Damascene Nyamwasa	Mission Environmental Officer		USAID / Rwanda and Burundi
David Kinyua	Regional Environmental Advisor		USAID/EA REA
Brian Hirsch	Bureau Environmental Officer (BEO) – USAID/Africa Bureau Office of Sustainable Development		USAID/AFR BEO

APPROVED BY AND DATE APPROVED

Name	Title & Mission/Office	Date	Role
Teresa Bernhard	Agency Environmental Coordinator		ECOS COR

ANNEX A: REPORT OUTLINE

Cover Page

Acknowledgements

Front Material

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1.1 Purpose

1.2 Brief Description of the USAID Program

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3.1 Major Ecosystem Types and Status

3.2 Status of Tropical Forests

3.3 Species Diversity and Status

3.4 Genetic Diversity

3.5 Status and Management of Protected Areas

3.6 Status and Management of Key Natural Resources Outside Protected Areas

3.7 Overview of Ecosystem Services

4. Legal Framework Affecting Conservation

4.1 National Laws, Policies and Strategies

4.2 International Agreements

4.3 Government Agencies

4.4 Conservation Initiatives

5. Threats to Biodiversity (including Tropical Forests)

5.1 Direct Threats to Biodiversity

5.2 Drivers of Threats

6. Actions Necessary to Conserve and Sustainably Manage Biodiversity (including Tropical Forests)

7. Extent to Which the Mission Meets the Identified Actions Needed to Conserve and Sustainably Manage Biodiversity (including Tropical Forests)

8. Recommendations to Conserve and Sustainably Manager Biodiversity (including Tropical Forests)

Annexes

ANNEX A: SCOPE OF WORK

ANNEX B: REFERENCES/DOCUMENTS CONSULTED

ANNEX C: LIST OF INSTITUTIONS CONSULTED - Refer to ADS Chapter 508 for the organization, functions, policies, and procedures contained within the USAID Privacy Program.

ANNEX D: ADDITIONAL MAPS, GRAPHICS AND TABLES

ANNEX E: SUCCESS STORIES IN CONSERVATION INITIATIVES (1 page per story)

OPTIONAL ANNEXES:¹²

- Key Changes and Updates from the Previous FAA 118/119
- Lessons Learned from the Previous FAA 118/119
- Additional Threatened and Endangered Species Information
- List of Scientific Names of Species Referenced in the Report
- Site-based Visit Details/Case Studies
- Sector Specific Reviews
- Bio-sketches: provided in compliance with ADS 508 Privacy Program

¹² Inclusion of these optional annexes will be considered during the development of the Work Plan.